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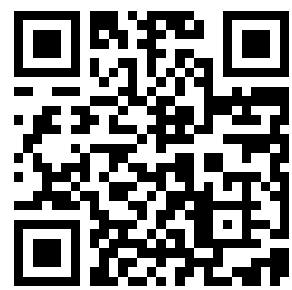

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MEMOIRS

OF THE

ROYAL ASTRONOMICAL SOCIETY.

VOL. VII.

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LONDON:

PUBLISHED BY JOHN WEALE,
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1834.

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REPORT

ON THE

PENDULUM EXPERIMENTS

MADE BY

THE LATE CAPTAIN HENRY FOSTER, R.N.,

IN HIS SCIENTIFIC VOYAGE IN THE YEARS 1828—1831,

WITH A VIEW TO DETERMINE

THE FIGURE OF THE EARTH.

DRAWN UP

AT THE REQUEST OF THE COUNCIL OF THE ROYAL ASTRONOMICAL SOCIETY,

By FRANCIS BAILY, Esq., V. P. R. S., &c. &c. &c.
AND PRESIDENT OF THE SOCIETY.

PRINTED BY ORDER AND AT THE EXPENSE OF
THE LORDS COMMISSIONERS OF THE ADMIRALTY.

LONDON:

PUBLISHED BY JOHN WEALE,

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ADVERTISEMENT.

THE following REPORT on Captain FOSTER's Pendulum Experiments having been presented, by the Council of the Royal Astronomical Society, to the Lords Commissioners of the Admiralty, their Lordships were pleased to direct that the same should be printed at the public expense, as part of the MEMOIRS of the Society: and when it was sent to press, it was intended that it should form the first of *several* papers that might tend to complete the seventh volume of the Memoirs. But the Tables having occupied more space than was originally contemplated, it has become necessary to limit the volume to this Report only.

With respect to the Tables themselves, it will be seen that the first four, which are by far the most extensive of the whole, are essential for the determination of the *rate* of the pendulum-clock: a very important element in any inquiry of this kind. And although (had Captain FOSTER's life been spared, to have completed the necessary computations himself) these Tables might probably have been abridged, or the element itself have been suffered to rest on his own high character for accuracy and integrity, yet under the melancholy circumstances detailed in this Report, it was not considered just or fair to his memory that, in an object of this importance, any portion of his experiments should be left a subject of doubt, disputation, or cavil. Every means therefore have been

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afforded to the reader for the verification of the computations through every step of the process.

Since these sheets have been in the press, Captain LLOYD, who took out one of KATER's invariable pendulums (No. 7) to the Mauritius, has sent home the result of some experiments made therewith; which fully confirm the excess in the number of vibrations indicated by M. M. FREYCINET and DUPERREY, in their experiments at that island. But the *details* of those experiments have not yet been received.

F. B.

April 28, 1834.

*** *The original MS. register of the Observations made by Captain* FOSTER, *as well as the MS. tables computed by Mr.* RICHARDSON, *(from which the Tables in the Appendix to the present Report are printed,) are deposited at the* ADMIRALTY.

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ERRATA.

Page	Line	*For*	*Read*
20	19	after " subsequent places" insert	except at the Cape of Good Hope, where the Chronometer No. 902 was employed.
31	2	their	there
40	23	77·36 479·99	97·36 499·99
40	24	290·73 3183·66	310·73 3203·66
54		The latitude of the *Observatory* of the Cape of Good Hope is 33° 56′ 3″ instead of 33° 54′ 37″; which appears to be the latitude of the *town* or the *harbour*. This, however, will not make any perceptible difference in the comparative results in page 96.	
58	30	note (*b*)	notes * and † in page 356
68	32	77·36	97·36
73	26	·0006551	·0006403
73	30	·0274778	·0274780
74	10	CLAIRAULT	CLAIRAUT
81	31	86410·34	86401·34
90	4	27	37
90	28	No. 2 and 3	No. 1 and 2
101	22	*c* = (the reciprocal, &c.	*c* (= the reciprocal, &c.
159	27	1 50 3·7	1 50 3·17
168	4	The star which preceded the transit of the moon, and the two stars which followed, were observed for the longitude. The first had an altitude of 45° 55′, and the last an altitude of 45° 25′. The star, which immediately followed the moon, was near her; but the altitude is not given by Captain Foster.	
—	6		
—	7		
229	1	329	229
307	Aug. 22	A=83	A=82

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PAPERS.

1. *A Report on the Experiments made by the late Captain* HENRY FOSTER, *R.N., with the Pendulums taken out by him, in his scientific voyage, in the years* 1828—1831. *Drawn up at the request of the Council of the Royal Astronomical Society, by* FRANCIS BAILY, *Esq., V.P.R.S., &c. &c., and President of the Society.*

Presented July 17, 1833.

THE unfortunate and melancholy accident, which so suddenly befel Captain FOSTER, just at the close of his late scientific voyage, has not only deprived the world of an active and accomplished officer, and an ardent and zealous enquirer after truth, but has also rendered it necessary that the extensive and valuable series of experiments made by him, on the pendulum, in various parts of the world, should be completed by another hand. The Lords Commissioners of the Admiralty, therefore, under whose auspices the expedition was formed and promoted, referred it to the Council of this Society to consider and determine what steps should be taken on the subject: and the Council have been pleased to request me to undertake the delicate and arduous task of completing the series of experiments, by swinging the pendulums again on their return to London, and by superintending the examination and reduction of the whole of Captain FOSTER's pendulum observations.

In complying with this request, I have been induced not only by the high regard and esteem which I had for my lamented and valued friend, as well as by a desire that my name may be handed down, united with his, in this curious and important enquiry; but also by the impression and hope that my own

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investigations and observations, connected therewith, may not be wholly useless in the further pursuit of this branch of science. Previous to Captain Foster's departure, the subject of the pendulum had been the frequent topic of our conversation: and it was at my request that he consented to take out, and experiment upon, the two pendulums (of a new construction) belonging to this Society, which will form part of the subject of this Report. At that time I had been engaged in a variety of experiments on different kinds of pendulums: and, since that period, have not only pursued the same subject in the usual manner, but have caused a vacuum apparatus to be fixed up at my own house, at considerable expense and trouble, in order not only to determine more accurately the correction which ought to be applied for what has usually been denominated the "buoyancy of the atmosphere," but likewise for the investigation of other points connected with this delicate branch of enquiry: a detail of which will be found in the *Philosophical Transactions* for 1832.

Having therefore, within my own power, the means of pursuing the enquiry with ease and convenience to myself and at my own leisure, I could not hesitate in devoting the necessary time and attention in completing the extensive series of experiments commenced under such favourable circumstances, conducted with so much zeal, so much skill, and such a scrupulous regard to truth and accuracy, but unfortunately terminating in so sudden and lamentable a manner. It is however a fortunate circumstance that the books and papers of Captain Foster, which were kept by him in the most neat and scientific order, contain every thing that is requisite for a full understanding of his mode of proceeding, and for obtaining the result of his pendulum experiments. These documents, together with the several pendulums, which will be hereafter described, have been placed in my hands by the Lords Commissioners of the Admiralty; and I shall now proceed to report on the whole in detail. But, previously thereto it may be proper to make a few remarks relative to the life of Captain Foster; in order to show how eminently qualified he was to undertake the subject in question.

Captain Henry Foster was the son of the Rev. Henry Foster of Woodplumpton, near Preston, in Lancashire. He entered the Royal Navy in the year 1812: and, having served under Admirals Bertie and Alexander, joined Captain Hickey in the *Blossom*. When this ship visited the Columbia river (with the Commissioners to establish the boundary line between Great Britain and the United States) he commenced his scientific operations by surveying the mouth of that river: and, afterwards in the *Creole*, under Commodore

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BOWLES, he made a survey of the north shore of the river La Plata. But, it was not until serving in the *Conway*, under Captain BASIL HALL, that his scientific qualities were fully evinced and duly appreciated. For, in addition to the employment of surveying, he was intrusted with the use of a collection of astronomical instruments, which had been supplied to Captain HALL by the Board of Longitude: and he also assisted him in making the pendulum experiments, which are the first of the kind that he ever undertook. The detail of these experiments is given in the *Phil. Trans.* for 1823: and Captain HALL, in that paper, thus notices the services of this young philosopher. "Mr. FOSTER "is the gentleman to whose co-operation I owed so much when observing the "Comet at Valparaiso: an account of which, in a letter to Dr. WOLLASTON, "has appeared in a recent volume of the Transactions (1822). His present "work speaks sufficiently for itself: but, I should be doing him scanty justice "by confining myself to such a reference, without also stating that, occupied "as I am with professional duties, it would have been hopeless to have under-"taken these experiments, without the zealous assistance of a person, who, "besides being free to attend exclusively to the subject, was thoroughly skilled "in all its details." On his return to England he was elected a Fellow of the Royal Society. His next appointment was to the *Griper*, Captain CLAVERING, on her voyage with Captain SABINE, to the coasts of Greenland and Norway: and, on the return of the ship, he was promoted to the rank of Lieutenant. In Captain PARRY'S third voyage to the North Pole, Lieutenant FOSTER was appointed to the *Hecla:* and when at Port Bowen, he made not only a valuable series of experiments on the invariable pendulum, intrusted to his care by the Board of Longitude, but also other interesting observations on magnetism and refraction, which are printed in the *Phil. Trans.* for 1826; and for which the Royal Society bestowed on him their highest reward, the Copley Medal. On the same day he received from the Admiralty the rank of Commander; and, shortly after, his appointment to the *Chanticleer*, for the purpose of undertaking the scientific voyage which is the subject of the present Report.

It will be needless for me to enter on the particulars of this voyage; more especially as I understand they will form the subject of a separate publication. I shall therefore merely state that Captain FOSTER, after having touched at Madeira, Rio Janeiro, &c., proceeded to Monte Video, where the pendulum experiments were commenced; thence, in succession to Staten Island on the coast of Terra del Fuego, to South Shetland, to Cape Horn, to the Cape of Good Hope, to St. Helena, to the island of Ascension, to Fernando de Noronha,

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to Maranham, to Para, to Trinidad, and lastly to Porto Bello: at each of which places the pendulums were swung, the details of which will be given in the sequel. The pendulum experiments at this latter place being completed, Captain FOSTER was proceeding to carry into effect the remainder of his instructions; which were to determine the difference of longitude between Porto Bello and the town of Panama situate on the coast of the Pacific Ocean. The events that afterwards occurred, and which closed the sad scene of Captain FOSTER's labours, are so feelingly and so forcibly described by his First Lieutenant (now Captain) AUSTIN, in a letter to Captain BEAUFORT, the Hydrographer to the Admiralty, that I need not make any apology for placing it here as the termination of this short history of Captain FOSTER's interesting but unfortunate voyage.

"*H. M. Sloop, Chanticleer, Off Chagres, February* 9, 1831.

"SIR,—The length of time Captain FOSTER and myself have been personally acquainted, and more especially from being selected by himself as his senior Lieutenant on this unfortunate and lamentable voyage, will sufficiently account to you for the knowledge I possess of his sentiments. Such being the case, I (his poor, very poor representative on this occasion) consider it my duty to give you the earliest intimation of our ever to be lamented loss.

"On our arrival at Porto Bello, on the 22d of December, Captain FOSTER immediately began the pendulum experiments; and despatched me to Panama to ascertain the practicability of measuring the isthmus by rockets, in pursuance of his orders. The journey across being performed wholly on foot, I did not return to the ship until the 12th of January; when I found Captain FOSTER had finished his experiments, and was anxiously waiting my arrival: indeed, he was so solicitous to prosecute, with all possible despatch and fidelity, the admeasurement of the isthmus, that he had determined on sailing for Navy Bay on the 13th had I not arrived. In my report, I represented to him the extreme difficulty and impracticability of measuring by chronometers, via Porto Bello. We accordingly sailed for Navy Bay on the 13th [ult.]: and Captain FOSTER left the ship, in his gig,* for Chagres at daybreak on the 14th;† taking with him two chronometers and the requisite instruments. He intended to have proceeded up the river in his gig; but, on his arrival at

* The *gig*, here alluded to, is the ship's boat so called.—F. B.

† This date, in the letter, is the 4th: but, on referring to the log-book, it appears that it should have been the 14th.—F. B.

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" Chagres, he preferred taking one of the country canoes as far as Cruces, and " thence overland to Panama.

" To co-operate with him, and to ascertain positively whether the experi- " ments could be performed agreeably to his instructions, the second Lieutenant, " with a strong party, were sent to Porto Bello in the launch; with orders to " proceed to an elevated and central station, recommended by myself as the " most eligible for the purpose. The rockets were fired from this place at the " appointed times, but were not seen either by Captain FOSTER at Panama, or " by the officer stationed on the hills contiguous to Porto Bello. Captain FOSTER " returned to the ship in Navy Bay on the 25th [ult.], in high health and " spirits, as well as the whole of the rocket party from Porto Bello. The " Captain remained but two days, to get the error of his watches; and sailed " again on the 28th, accompanied by the second Lieutenant and a small party " for firing rockets at Cruces: his object being to measure the distance between " Panama and some fixed point on the shores of the Atlantic; viz. Chagres. " Every thing had been done at Panama, and the experiments were about to " conclude; and the Captain embarked in a canoe at Cruces, on Saturday " morning the 5th of February, and was returning down the river in great " exultation; when, just as it became dusk, the canoe having passed a rapid, " some extraordinary feeling was excited in the Captain's mind, and he arose to " see that all was right. He got out at the after part of the canoe, and was " seating himself on the top of the thatched awning, or covering, of the canoe, " with his feet resting on the gunwale (and you cannot conceive of how frail a " texture these coverings are, for they are nothing but a few dried reeds), when " the awning gave way, and he was precipitated into the water. The moment " it was heard, an enterprizing young officer, Mr. Fox, and the Captain's " trusty coxswain, PETER VEITCH, instantly jumped overboard, and exerted " themselves in the most noble manner: but, as a strong current was setting " down the river, they were unable to reach the spot in time. Our unfortunate, " but highly talented, chief was seen, to their horror, sinking in the water; " and in a very few moments he disappeared, and was lost to us for ever. " Those, who jumped overboard so promptly, were quickly obliged to regain the " canoe: but they remained two hours upon the spot, searching unsuccessfully " for the body. They proceeded to Chagres that night, in great distress; and " early on Sunday morning brought the melancholy intelligence to the ship; " which was under weigh, off Chagres, waiting the arrival of Captain FOSTER.

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" Such was our dismay at the disastrous calamity, that I have not words to " express our feelings: for, though but a humble admirer of the science of our " service, my zeal and patriotism have often called forth prayers that our talented " chief might be preserved to the completion of his mission.

" I immediately despatched the gig, under the direction of the master, to " diligently search for the body, with five days' provisions: at the same time I " offered a reward of twenty dollars to any of the natives who should procure " his remains, in order that they might be interred. And it is some small " gratification to be enabled to add that we were fortunate enough to obtain the " body on the subsequent Tuesday. For, Lieutenant Williams, who had " been left at Cruces for the performance of rocket experiments, on becoming " acquainted with the distressing accident, immediately came down in a canoe, " and joined the party I had sent up in the gig: and the body was found " floating a few miles below the place where the accident occurred. From the " dreadful state of the body, it was impossible to bring it down: it was therefore " deemed advisable to inter it on the spot. A grave four feet in depth was dug: " and, shrouded in the colours of his country, he was buried with every " attention circumstances would permit. The grave was banked, well staked, " and decently wattled. A board was carved, by Lieutenant Williams, with " his name and the day and manner of his death; and conspicuously affixed to " a lofty tree immediately over the grave; and which can be readily observed " by any one going up or down the river.

" To Lieutenant Williams's exertions and kindness on the occasion I " cannot bear sufficient testimony: and it is a great loss to this officer that I " have not the pen of Captain Foster, to detail to you his able services, and " scientific attainments; for he was always associated with Captain Foster " in his labours and observations. With his assistance I look forward to be " enabled to give you satisfaction in the hydrographical department.

" It is necessary to inform you that Captain Foster's body had been " plundered, by some of the canoe men, of his valued and private chronometer; " together with his rate book, containing all his observations since leaving " Porto Bello. But, the Government watch was found in a breast pocket on " the left side; and escaped detection, I presume, from the unusual circum- " stance of a person carrying two watches.

" Having obtained permission from the Governor to erect a tablet to his " memory, in any place I might think fit, I have accordingly done so in the

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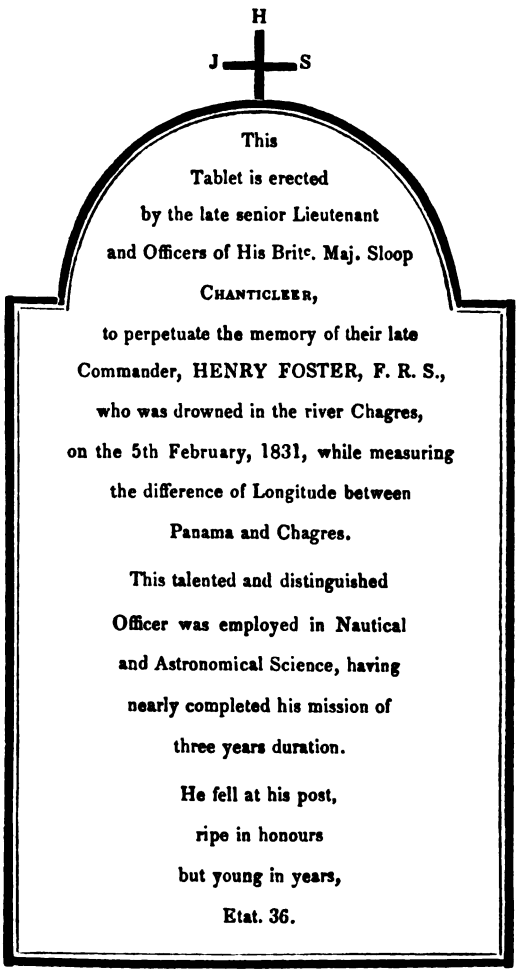
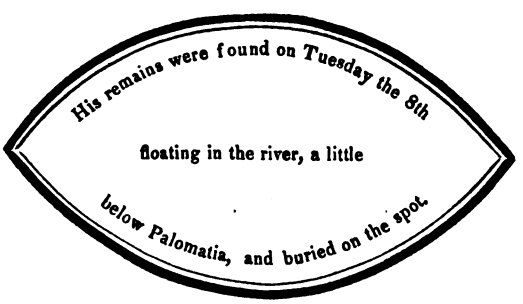
" port of St. Lorenzo, at Chagres. It is a very large piece of very hard and " durable wood, in the usual form of a grave stone, having a copper plate with " the following inscription neatly engraved thereon.



" Afterwards was placed underneath the former—



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" Amongst the multiplicity of duties that have thus suddenly devolved upon " me, I am unable to write, in such a manner as I should wish, to his relations " and friends: I have therefore thrown myself upon your kindness, and have " adopted what appears to me the most eligible course, inasmuch as it was his " constant and earnest wish that you should be the person to whom his papers " should be consigned, if any thing happened to him. In accordance with this " feeling, permit me to confide to your better judgment, the mode of communi- " cating to his Father, the Rev. Henry Foster of Woodplumpton, near " Preston, the distressing and melancholy event of the death of his favourite " and distinguished son, which I am afraid will prove a stroke too severe for " his declining years. I condole and sympathize most deeply with him; and I " beg to assure the Reverend gentleman that his young grandson, who is a " volunteer on board the *Chanticleer*, shall receive the kindest attentions I am " enabled to pay him.* * * * *

" His papers are voluminous and multifarious, and will necessarily require " some time to assort. I intend selecting and arranging them, in conjunction " with Mr. Webster the Surgeon, who was a guest at the Captain's table " for the last twelve months, and was favoured with his friendship. All his " private documents will be faithfully preserved for your disposal. He has not " left any testamentary document, nor is there any private journal. His pro- " perty of course devolves to his father; and the most scrupulous regard will be " paid to his concerns, and such as I hope will prove satisfactory to all his " relations. I have forwarded, by the same conveyance, as this, an official " statement for the information of my Lords Commissioners of the Admiralty.

" Thus I believe, and hope, that every thing has been done with propriety; " and that I have entered into all the detail that a letter admits of. Permit me " to apologize for the length of the communication, and the trouble I have " given.

" With every sentiment of respect, I have the honour to be,
" Sir, your obedient humble servant,
" HORATIO T. AUSTIN.

" *To Captain Beaufort.*"

Description of the Instruments and Apparatus.

Captain Foster took out with him a 30 inch Transit instrument (furnished with 5 wires in the focus) supported on a cast iron stand; a 13 inch Altitude and Azimuth instrument; and a 12 inch Repeating circle: this latter was

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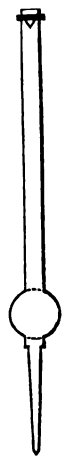
completely destroyed by a hurricane at South Shetland, as I shall more fully relate in the sequel; but I believe another was afterwards sent out to meet him on his way home. Besides these he had two (or more) clocks, with which the coincidences of the pendulums were taken; various chronometers, thermometers, barometers, hygrometers, sextants, &c. &c. The transit instrument was always used for determining the time: it was fixed on a barrel, filled with sand or stone, placed in a separate portable wooden building; and a meridian mark (capable of being illuminated at night) was set up at a convenient and proper distance. The whole of the transit observations will be found in the APPENDIX hereto; together with the daily comparisons of the transit chronometer with the pendulum clock. Besides the observatory, above alluded to, Captain FOSTER had another portable wooden building, in which the pendulums were swung at those places where he could not be accommodated with a house, or other building, suitable to his purpose.

Captain FOSTER also took with him four different pendulums: two of which were of brass, and formed precisely in the same manner as the invariable pendulum used by Captain KATER in various parts of England, in the years 1818 and 1819, and described by him in the *Phil. Trans.* for 1819, page 341. These belong to the Admiralty, and are respectively numbered, on the bob, No. 10 and No. 11. Each of these pendulums is furnished with separate agate planes; on each of which (in order to prevent mistakes) is engraved the same number as its corresponding pendulum. And it was Captain FOSTER's invariable plan, at the different places at which he experimented, to dismount the agate plane, with its pendulum, and replace them in their proper box, before the succeeding pendulum was taken out. This precaution might have been expected from Captain FOSTER's known accuracy, and minute attention to such matters; as he was well aware of the errors that might arise from any confusion of this kind: and it has been fully confirmed to me by the officers who attended him in the prosecution of some of his experiments.



The other two pendulums are the property of this Society (one of *iron* and the other of *copper*); and are of the kind called convertible pendulums. They are formed in the manner described by me in a short Paper read before this Society on June 13, 1828: an abstract of which is given in the *Phil. Mag.* for August 1828. As that Paper was not intended for publication, and therefore may not be generally known, I shall here enter into a more minute

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The other two pendulums are the property of this Society (one of *iron* and the other of *copper*); and are of the kind called convertible pendulums. They are formed in the manner described by me in a short Paper read before this Society on June 13, 1828: an abstract of which is given in the *Phil. Mag.* for August 1828. As that Paper was not intended for publication, and therefore may not be generally known, I shall here enter into a more minute

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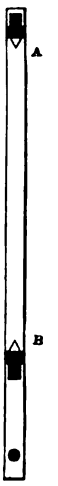
description of the pendulums in question. The pendulum, in fact, consists merely of a plain straight bar, 2 inches wide, $\frac{1}{2}$ an inch thick, and about $62\frac{1}{2}$ inches long: at least, it should not, in the first instance, be shorter than this, in order to allow a portion of it to be filed off (if necessary) for the requisite adjustment to synchronism. For, the property of convertibility in these pendulums, instead of being effected by moveable or sliding weights, is produced by *filing away* one of the ends of the pendulum, until the number of vibrations on the two knife edges are, in a given time, equal to each other (or nearly so) after the proper corrections are made. At the distance of 5 inches from one end of the bar, is placed the apex of one of the knife edges; which, for the sake of a convenient reference, I shall call the knife edge A. And at the distance of 39·4 inches therefrom, is placed the apex of the other knife edge, which I shall call the knife edge B. Each knife edge is firmly and properly secured, in the usual way, to knee pieces fastened on the bar, in the manner described by Captain Kater, in the account of his pendulum in the *Phil. Trans.* for 1818. On these knee pieces, the above letters are engraved: on one side in large Roman capitals (A and B); and on the opposite side, in small Roman letters (a and b), in order to designate the position of the pendulum when placed on the agate planes.



In the preliminary and rough experiments for adjusting the bar to a state of synchronism on the two knife edges, we need attend only to the corrections for the arc of vibration and the temperature of the room: as all the other sources of error may be considered as common to the two positions of the pendulum, and consequently rejected in these first trials. If it should be found (as probably will be the case) that the intervals of the coincidences on the knife edge B, are shorter than those on the knife edge A; (or, in other words, that the knife edge B makes a less number of vibrations in a day than the knife edge A;) we must file away a portion of the bar, at the end B, until the vibrations on the two knife edges are synchronous, or nearly so. The amount to be taken away can be ascertained only by repeated experiments: but as we approximate towards the truth, we must be more cautious in using the file, and more accurate in making the observations of the coincidences, until we have at length brought them nearly to a state of equality. In this latter step of the process, it may be difficult to determine, in all cases, the exact quantity that has been filed away: and we may therefore overdo it, so as to cause an inequality in the vibrations, of an opposite kind, and thus render it necessary to *add* a small

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quantity to the end B. This difficulty was foreseen: and in order to obviate it, I caused a small hole to be made in the bar (previous to the experiments for adjustment) about $1\frac{1}{2}$ inch from the end B, and about $\frac{1}{2}$ an inch in diameter. This hole is fitted by two screws, drawing towards each other, leaving a small space in the centre; which enables the experimentalist to place between them a small piece of sheet lead, or other substance; which piece may be increased or diminished at pleasure, without any further filing of the bar. By means of this contrivance (which I shall call the *adjusting piece*) the adjustment may be carried to any required degree of accuracy: but, great minuteness is not absolutely necessary, since the unavoidable errors of observation will baffle all our attempts at perfect synchronism; and the true values may always be attained by computation, from the relative distances of the knife edges from the centre of gravity.

The form and construction of this pendulum appear to me to possess advantages which do not attach to the pendulum, as usually constructed; whether we consider it as a convertible pendulum for determining the important problem first practically illustrated by Captain KATER; or whether it be viewed only as a travelling instrument for ascertaining the figure of the earth. In the former case, it is preferable on account of its simplicity and compactness: none of the parts slide over another, there are no sliding weights, no moveable screws, no wooden tail pieces: every thing is uniform, compact, and stationary. In the latter case (as a travelling instrument) there are several advantages attending the placing of two knife edges on one and the same bar: for, 1st. We are thereby possessed of two (although united, yet) distinct and independent pendulums, the results of which may be used separately or conjointly at pleasure; and each of which is a more complete check on the other, than when consisting (as in some voyages) of two separate pendulums, that may probably be of different specific gravities and of different expansive qualities.* 2nd. The knife edges, being once rendered nearly synchronous, will never deviate materially therefrom, into whatever part of the world the pendulum may be carried; and we are thus enabled, if it should be required, to determine the length of the simple pendulum at any point of the globe at which it may be swung. 3rd. We are thus furnished also with the means of ascertaining whether the pendulum has sustained

* No experiments of this kind ought to be undertaken with less than *three* pendulums; that, in case of any discordance, we may know to which pendulum it should be attributed. And if these pendulums were convertible ones (in which case they would afford *six* distinct results) the chance of error would be much less, and its detection more certain.

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any accidental injury; since such a fact would be *immediately* discoverable from the inequality in the number of vibrations between the two knife edges. And even in the case of such an unforeseen occurrence, the ratio between the two would, from that moment, remain the same in all parts of the world, and answer the same useful purpose of comparison during the remainder of the voyage. Whereas, in the pendulum, as usually constructed, the effect of such an injury, if not suspected, might be attributed to the errors of observation, local attraction, or some other cause: and indeed the fact itself could not be ascertained until the return of the observer to some place where the pendulum had been previously swung; leaving, however, the precise *time*, at which such accident happened, still undetermined, and not only the observations themselves, during some indefinite period, the subject of doubt and suspicion, but probably the whole series of no utility or avail. 4th. If the distance between the knife edges were accurately measured, previous to any series of experiments, we may not only determine the absolute length of the seconds pendulum at each station, an object very desirable; but moreover be able to ascertain whether any injury, that may accidentally have occurred, has arisen from a wearing of the knife edges. There are also some advantages attending the *form* of this pendulum: for, being uniform in its dimensions, without any protuberant bob, or thin projecting tail piece, it is not so liable to accidents as the ordinary pendulum, where those parts present facilities for injury. It is also capable of being packed in a more convenient case, and thus rendered more easy of transportation. The length of the iron pendulum is 62·1 inches; and its weight 24·40 pounds troy. The length of the copper pendulum is 62·5 inches; and its weight is 27·04 pounds troy. But were I to construct another pendulum of this kind, I should not make the distance between the knife edges more than 39 inches. This would be a very convenient and satisfactory distance to measure; since we need not employ any other fractional part of the inch than what would be comprised within the run of the microscope. A brass pendulum of this sort would weigh about 25 pounds troy; and its vibrations would continue 5 hours, commencing with an arc of 1°, and terminating with an arc of 0°·10.* The object in having one of the above pendulums made of iron, and the other of copper, was for the purpose of ascertaining whether any, and what, difference in the results would

* If thought preferable, the portion of the bar, between the knife edges, might be made much thinner; in which case the ends might be made thicker, and thus tend to prolong the period of its vibrations: but, I prefer an uniform thickness throughout its whole length.

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be occasioned by the use of pendulums made of different kinds of metal. But, as it appears from Captain FOSTER's experiments, that there is no perceptible difference at any of the places where he landed (and at some of them, from the nature of the surrounding country, it was expected that there would have been) it will be more convenient and safe to have them made, as usual, of brass: since this metal is not so liable to corrode as the others, is more easily worked by the artist, and its rate of expansion is better ascertained.

It may be proper here to state that the adjustments of the present iron and copper pendulums, to a state of synchronism, were made, and the series of preliminary experiments completed, before the verification of M. BESSEL's important discovery of the inaccuracy of the usual correction for the reduction to a vacuum; whereby it is shown that the same correction will not apply to the two ends of such a convertible pendulum. As the true length of the seconds pendulum, however, was not the subject of Captain FOSTER's enquiry, but merely its relative length at different latitudes, this circumstance will not affect the present results: more especially as I have since determined the true quantities from actual experiments in vacuo, as I shall more fully detail in the sequel.

As these pendulums are formed without any tail piece, it became necessary to adopt some other mode of determining the arc of vibration. This was easily done by making the *edge* of the pendulum, which is perfectly straight, answer the purpose of the pointed end of the tail piece in the ordinary pendulum. This method also enables us to enlarge the divisions of the scale; which very much facilitates the observations of the arcs. With this view I directed a diagonal scale to be formed about 4 inches long, and also a diaphragm of a new construction for observing the coincidences, which I shall now proceed to describe.* In the front of the clock-case, at a convenient point for observing the coincidences, one of the panels is made to slide down, or to be taken away; and to the top (or bottom) of this opening, is affixed the new diaphragm with the diagonal scale just mentioned. The diaphragm is formed very similar to a parallel ruler: it being, in fact, merely two narrow slips of brass, *a*, *b*, about $\frac{1}{2}$ an inch wide, and 6 inches long, separated from each other about 2 inches, or about the width of the pendulum. It has three adjustments: viz. one for bringing it into a vertical position, which is effected by making the whole move round a stiff

* It will be recollected that the diaphragm, as originally suggested by Captain KATER, is placed within the tube of the telescope.

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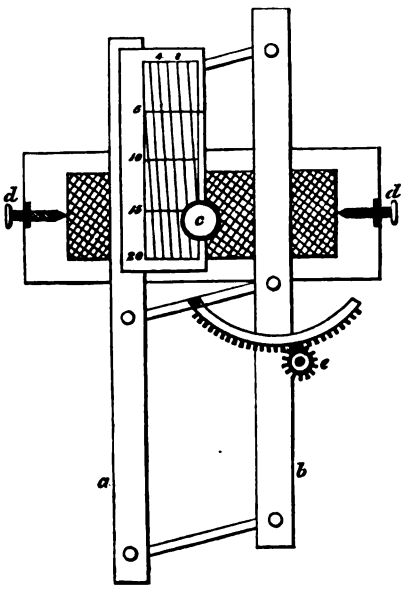

joint *c*: another for moving it horizontally, so as to bring it into the same line of vision (as seen from the telescope) with the pendulum and the luminous disc, which is effected by means of side screws *d*, *d* acting on a plate, set in a dove tail slider: and the third for enlarging or diminishing the distance between the parallel plates, and which is effected (not by a tangent screw, which disturbs the parallelism, but) by means of a circular rack and pinion *e*. The parallel plates should not be too wide, lest they obstruct too much of the light required for illuminating the white disc, which is fixed on the pendulum of the clock. The whole is blackened, and all extraneous light cut off by means of a black screen placed in front of the apparatus: so that, on looking through the telescope, no object can be perceived except the luminous disc, the pendulum, and the diagonal scale which I am now about to describe.

This diagonal scale is about 4 inches long and about $1\frac{1}{2}$ inch broad: and on the assumption that the vertical distance from the plane of suspension is 39 inches, contains an arc of about $1\frac{1}{2}$ degree. Each degree is divided into 5 equal parts; and, by means of horizontal lines, each of these parts is subdivided into 20 other equal parts; so that each degree is thus divided into 100 equal parts. Should the position of the pendulum be such, with respect to the scale, that the distance between them bears an appreciable ratio to the distance between the telescope and the pendulum, a correction must be made for the same, which is easily computed. The magnitude of the arc of vibration is shown by the intersection of the edge of the pendulum with one of the lines of the scale; similar to the plan adopted on the old mural quadrants. In order to preserve this scale in its proper position, it should be screwed (with adjusting screws) to the top of one of the parallel bars (prolonged), in such a manner that its zero line should be a continuation of the inner edge of such bar, when viewed through the telescope: consequently, when the parallel rules are accurately adjusted, the diagonal scale must necessarily also be in correct adjustment; and this prevents the necessity of having a scale on each side. In order to adjust the diaphragm for observing coincidences we must bring that side of it, to which the diagonal scale is affixed, into apparent contact with the edge of the pendulum, as viewed

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through the telescope: after which, the other side of the diaphragm must be brought, by means of the rack and pinion, into apparent contact with the opposite edge: so that none of the reflected light from the white disc on the clock pendulum, can be seen on either side of the pendulum of experiment.* In the diagonal scale which was made for Captain FOSTER, the lines were not cut sufficiently strong and dark; and he was therefore sometimes prevented from seeing them distinctly; a circumstance of which he complains in some of his observations, as may be seen by the Notes in the Appendix. In the experiments with the two brass pendulums, Captain FOSTER always used the common circular arc; the magnitude of which was indicated by the pointed end of the tail piece.

In the pendulum experiments made by Captain KATER in various parts of England, and by Captain SABINE in various parts of the world, the clock was attached to the wall of the room in which the experiments were made: and, over the clock, an iron bracket was also fastened to the wall, on which the agate planes were placed. But, in all the experiments made by Captain FOSTER (except at Mr. Browne's house in London) the clock and the pendulum of experiment were each supported by separate tripod stands; in the same manner as in the experiments made by him at Port Bowen in the year 1825. The triangular stand which supported the clock, and which was the smallest in its dimensions, was made of wood: but, that which supported the pendulum, and which may, in some measure, be considered as containing the other (since it stretched over it, and occupied a greater space), was of iron. Even at the Observatory at Greenwich, and at the Cape of Good Hope, where other means presented themselves, he prudently adopted the same course. The triangular stands, used with the brass pendulums, were separate and distinct from those used with the iron and copper pendulums: and it is proper to state that the latter pendulums, on account of their greater thickness, could not, by any possibility, be suspended on the agate planes belonging to the brass pendulums; as well as the fact that, although each of the brass pendulums was furnished with its own agate planes, yet that the iron and copper pendulums had only one set of agate planes, in common to them both.

The copper pendulum was washed with a solution of platinum: and the iron pendulum was coated with a kind of varnish. The latter pendulum, however, notwithstanding this precaution, was found to have acquired some rust,

* In the diagonal scale, which I have made for my own use, and from which the present drawing is taken, the divided part stands wholly *behind* the pendulum, when the pendulum is at rest. In Captain FOSTER's, it stands on one side; and the divisions are read the contrary way. I prefer the former construction.

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when it was unpacked at Staten Island, the first station at which it was used. This rust was effectually removed by Captain Foster, *prior* to his experiments at that place: and, in a letter which he afterwards wrote to Captain Beaufort, in November 1830, he says, "Mr. Baily need not be uneasy respecting the "corroded state of his pendulums; for, since the *dressing* I gave them at "Staten Island, previous to my experiments upon them at that place, they have "preserved their fresh appearance in a way beyond my most sanguine hopes "for them so to do." Nevertheless, Captain Foster had great doubts (arising from another source) about the accuracy of the results with the iron pendulum; in consequence of his having accidentally discovered, at the Cape of Good Hope, that the adjusting screw was loose. I have since, however, ascertained by direct experiments, instituted for that express purpose, that this fact will not influence the results at all: and, as Captain Foster *tightened* the screw, immediately on the discovery, no error can have arisen from this casual circumstance.

Method of registering the Observations.

It was Captain Foster's practice to record the first three and the last three coincidences; in order to guard against any error in noting down the precise times: a method which ought to be pursued in all observations of this kind. But, as I have used only the first and last coincidence, in computing the mean interval, these are the only ones retained in the extracts, given in the Appendix. The results generally agree with the mean intervals obtained by the preceding method, within a very minute and insignificant quantity. The height of the barometer, as well as of the three thermometers, were respectively recorded also at those times. In registering these observations he made use of *printed* blank forms, ruled into proper columns, with their respective headings at the top of each: a method which cannot be too much recommended in all similar cases. In fact, we are mainly indebted to this circumstance for the clear, distinct, and excellent state of preservation in which the manuscript observations exist: since there is not the least difficulty in understanding all the data requisite for obtaining the true results; nor the least doubt as to the meaning and application of every figure that is introduced. As a specimen of the printed forms above alluded to, I shall here insert the detail of two experiments made with the brass pendulum No. 11, at South Shetland, in January 1829: which will not only serve to show the mode of registering adopted by Captain Foster, and the arrangements for the computations, but also enable me to explain more fully in the sequel, some singular anomalies that occurred to this pendulum at the above station.

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EXPERIMENT, N° 10, *made at South Shetland, on January* 20, 1829, *with the* N° 11 *Pendulum. Knife Edge . The Clock making* 86478·60 *Vibrations in a Mean Solar Day. The Height of the Pendulum above the Level of the Sea* = 19 *ft.* 2 *in. Hygrometer* (*Temp.* = 38. *Dew-point* = 37). *Direction of the Plane of Vibration* N. 18° W., *and* S. 18° E. *by Compass. Time of High-water*

No.	Time of Disappearance.	Reappearance.	Coincidence.	Arc.	Thermometers.			Barometer.
					Upper.	Middle.	Lower.	
	h m s	s	s					
1	11 7 42	44	43·0	0·91	38·6	38·4	38·4	29·442
2	16 52	54	53·0	·87				
3	26 2	5	3·5	·82	39·0	38·8	38·8	
17	1 35 22	30	26·0	·36	38·5	38·4	38·4	
18	44 38	49	43·5	·33				
19	53 57	67	62·0	·30	39·0	38·6	38·6	29·429

	h m s	
First coincidence.....	= 11 7 43·0	Tab. log. = 9·54255
Last coincidence.....	= 1 54 2·0	Log. *b*... = 1·46888
Total int. (to be divided by 18)	= 2 46 19·0 = 9979	10·267 = 1·01143
Mean coincidence	= 554·389	
Corresponding to	86088·306 Vibrations.	

	Arc..... = +	·545	Corrections.
t = 38·65	Ther..... = −	9·877	
b = 29·436	Barom..... = +	10·267	
r = + 78·80	Rate..... = +	78·516	
	Result..... =	86167·757 Vibrations in a mean solar day.	

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Experiment, N° 26, *made at South Shetland, on January* 23, 1829, *with the* N° 11 *Pendulum. Knife Edge . The Clock making* 86478·85 *Vibrations in a Mean Solar Day. The Height of the Pendulum above the Level of the Sea* = 19 *ft.* 2 *in. Hygrometer* (*Temp.* = 38. *Dew-point* = 37). *Direction of the Plane of Vibration* N. 18° W., *and* S. 18° E. *by Compass. Time of High-water*

No.	Time of Disappearance.	Reappearance.	Coincidence.	Arc.	Thermometers.			Barometer.
					Upper.	Middle.	Lower.	
	h m s	s	s					
1	3 58 19	20	19·5	0·98	38·0	38·0	38·0	29·140
2	4 7 39	41	40·0	·91				
3	16 59	62	60·5	·85	39·5	39·4	39·0	
17	6 29 45	59	52·0	·31	37·5	37·5	37·5	
18	39 26	39	32·5	·29				
19	49 5	22	13·5	·27	37·8	37·8	37·8	29·158

	h	m	s	
First coincidence.....	= 3	58	19·5	
Last coincidence.....	= 6	49	13·5	
Total int. (to be divided by 18)	= 2	50	54·0	= 10254
Mean coincidence	=		569·667	
Corresponding to			86096·665	Vibrations.

Tab. log. = 9·54279
Log. *b*... = 1·46462
10·172 = 1·00741

	Arc..... =	+	·565
t = 38·40	Ther. ..... =	−	9·983
b = 29·149	Barom..... =	+	10·172
r = + 78·85	Rate..... =	+	78·573

} Corrections.

Result..... = 86175·992 Vibrations in a mean solar day.

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Captain FOSTER had not sufficient leisure, during his voyage, to deduce any results from his experiments. The only progress which he made in the computations was the determination of the mean interval for each experiment: but this could not give him much insight into the final result, since all the corrections were afterwards to be computed and applied. On this subject he expresses himself very properly, and almost *prophetically*, in a letter to Captain BEAUFORT, dated November 6, 1830, wherein he says, "I shall be very curious "to see what sort of results my labours will give in pendulums: for, I assure "you I have laboured hard with them; and in a manner and with the feelings "also of doing justice to the subject, rather than of merely gaining fame; and "without bias to one notion or another. *All the observations are fairly "recorded and honestly obtained; so that I am indifferent about whose hands "they may fall into, to compute, should it please God to render such auxiliary "necessary.* By the way, what think you of such a procedure under any cir-"cumstances? Would it not be more satisfactory to all parties." The hint, which is here thrown out by Captain FOSTER, might doubtless in many cases be followed up with good effect: but, it is also evident that we frequently require the assistance of the experimentalist himself to clear up and explain trifling discordancies which are occasionally discovered in the final investigations: and which can only be removed (if at all) by those who have been actually engaged in making the experiments.

In the printed blank forms, used by Captain FOSTER, there was sufficient space intentionally left for the necessary computations for determining the correct number of vibrations made by the pendulum, in a mean solar day. These computations have since been completed by Mr. RICHARDSON of the Royal Observatory at Greenwich, from tables and formulæ with which I furnished him for that purpose, and which will be fully explained in the sequel. And, in order to distinguish every additional figure that has been inserted on the pages, since the manuscript left Captain FOSTER'S hands, they are written in *red* ink. Not a single alteration has been made in the original manuscript, except in the case of some gross and obvious error: and in such cases (which amount only to nine, in the whole,) the alteration has been made also in *red* ink; and a note made of the same, with the reason for the alteration: which notes will be found in the Appendix.

A similar plan also has been adopted in computing the rates of the clocks, from the transits of the sun and stars, and the daily comparisons of the clock

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with the transit chronometer, made by Captain Foster; the calculation of which he had not at all entered upon. So that, in fact, during the whole of his voyage, he remained ignorant of the principal element for deducing correct results from his experiments. These computations have since been made by Mr. Richardson also; who has executed the whole in a manner at once indicating his skill, and known talent for such investigations.

In the Appendix to this Report are given the requisite abstracts from Captain Foster's observations and experiments; arranged in the most convenient manner for reference. Those for determining the rates of the clocks consist of four Tables: and those for determining the results of his pendulum experiments consist of two Tables. The following is the order of their insertion and arrangement.

Table I. contains the several periodical comparisons of the transit chronometer with the pendulum clock: the difference between the two being annexed in a collateral column. The whole of this table is an exact copy of the original manuscript. It appears that the chronometer No. 620 was employed with the transit instrument, at Monte Video, Staten Island, South Shetland, and Cape Horn: and that the chronometer No. 929 was employed at all the subsequent places. The clock employed with the brass pendulums was always the same: but a different one was employed with the iron and copper pendulums. And, it may be proper here to state that, at Para and at Trinidad, two pendulums (an invariable and a convertible one) were swinging at the same time; and consequently we have a double comparison of the clocks at those stations.

Table II. contains the transits of the sun and stars, observed with the five wires of the transit instrument; the times being denoted by the chronometer above mentioned: these are also an exact copy from the manuscript. In many cases Captain Foster has given, in a collateral column, the time of transit as deduced from a mean of the whole: but, where there is a blank, Mr. Richardson has computed and inserted such mean result. In the next collateral column Mr. Richardson has also given the comparison or difference of the clock at the time of such transits, deduced from the comparisons in the preceding table. In the last collateral column, he has given the differences between the two preceding columns: which consequently indicate the state of the clock, used in the pendulum experiments, at the time of the transit of such stars. These several values constitute the basis for determining the values in

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the next table. All the additional figures, which have thus been inserted in the original observation books, are made in *red* ink.

TABLE III. contains the reduced transits of the stars, finally used for the determination of the rates; or the times of such transits as indicated by the pendulum clock then in actual use: together with the time of *mean noon*, deduced from the transits of the sun.

TABLE IV. contains the rates of such pendulum clock in a mean solar day, as deduced from the times of the transits given in the preceding table: the acceleration for the interval being added, in the case of the stars. At the bottom of this table is given the daily rate, finally adopted in the computations, on the respective days therein stated. These last two tables are wholly computed by Mr. RICHARDSON; and form no part of Captain FOSTER's original manuscript: they are however founded on the method pursued by Captain FOSTER for determining the rate of his clock at Port Bowen, as stated in the *Phil. Trans.* for 1826, Part 2, pages 23, 24, 42, 43, 48, 49, and 59.

TABLE V. consists of 12 columns: the first contains the numbers of the several sets of experiments made at each place, and with the several pendulums mentioned at the head: the second contains the date: the next three columns express the time of the first and last coincidence, (the time of disappearance and reappearance of the disc being recorded, and thence the coincidence deduced): the sixth contains the magnitude of the initial and final arc of vibration: the next three contain the highest and lowest readings of the three thermometers during the interval of the experiment: the tenth contains the similar readings of the barometer: the eleventh contains the rate of the pendulum clock, deduced as above mentioned: and the last contains the state of the hygrometer during the experiment; that is, the temperature of the air, and the dew point, designated respectively by the letters A and D.*

TABLE VI. contains, 1st, the number in the series, at each place, corresponding to the number in the preceding table; for the sake of a convenient reference: 2nd, the total interval of the experiment, deduced from the times of the first and last coincidence: 3rd, the number of coincidences (minus unity) that have occurred in that interval: 4th, the mean interval, expressed in seconds of the pendulum clock; which is found by dividing the total interval in the second

* It has been thought, by many persons, that the state of *moisture* in the atmosphere might affect the vibrations of the pendulum: but, in what manner, or to what amount, has not yet been shown.

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column (expressed in seconds) by the number of coincidences in the third column: 5th, the amount of the several corrections for the arc, the thermometer, the barometer, and the daily rate of the pendulum clock, all deduced agreeably to the methods which I shall explain in the sequel: and lastly, the true number of vibrations made by the pendulum in a mean solar day, at the given station. To the mean of each result is added the correction for the height of the station above the mean level of the sea.

Method of reducing the Pendulum Observations.

Let m denote the mean interval of the coincidences, as given in the fourth column of Table VI.; and let r denote the daily rate of the pendulum clock, as given in the penultimate column of the same table: then will the number of vibrations (N) actually made by the pendulum, in a mean solar day, be

$$N = \frac{m-2}{m}(86400 + r) = \frac{m-2}{m}86400 + r\left(1 - \frac{2}{m}\right)$$

where r is to be taken as *minus*, when the clock is *losing*. Now, in the present computations, it was found more easy and expeditious to make N equal to $\frac{m-2}{m}86400$ only; and afterwards to apply $r\left(1 - \frac{2}{m}\right)$ as a separate correction for the rate of the clock. A table therefore was formed for every second of time of the mean interval; and the necessary computations were thus in progress, whilst the more arduous and difficult task of deducing the rates from the astronomical observations was also proceeding.

The correction for the arc of vibration has been deduced from the well known formula $N \times \frac{M \sin (A+a).\ \sin (A-a)}{32\ (\log \sin A - \log \sin a)}$: where M denotes the logarithmic modulus $= 0{\cdot}4342945$; A the initial, and a the final arc of vibration, expressed in degrees and decimals of a degree. But this formula may be rendered more convenient for computation by taking the *arcs* instead of the *sines*, and by assuming N equal to 86100 for all the pendulums: whence we obtain the correction equal to $86100 \times \frac{M \sin^2 1^\circ\ (A+a).\ (A-a)}{32\ (\log A - \log a)} = \frac{(A+a).\ (A-a)}{\log A - \log a} \times {\cdot}355916.$ This correction is always additive. In all these remarks I have used the term *arc* of vibration, in compliance with the general, but corrupt, acceptation of the term: it is the *semi-arc* which is strictly the subject of consideration.

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All the pendulum experiments have been reduced to a common standard of temperature, which in this country is assumed equal to 62° of Fahrenheit; and which I have therefore adopted in the present computations. As I had no means of determining the expansion of the different metals, I have adopted such as I have considered most worthy of confidence. The rate of expansion of the brass pendulums is the same as that determined by Captain KATER, for his original invariable brass pendulum; as given in the *Phil. Trans.* for 1819, page 343, and since confirmed by Captain SABINE, with respect to two other brass pendulums, of similar construction;* and adopted by all the experimentalists that have used such pendulums. The following are the assumed rates of expansion for 1° of Fahrenheit's thermometer, viz.

Brass bars	=	·00000982
Iron bar	=	·00000668
Copper bar	=	·00000944

The rate of expansion being denoted by e, the formula for the correction of the number of vibrations, on account of the temperature, will be

$$N \times \tfrac{1}{2} e\,(t - 62°)$$

where t denotes the mean height of all the thermometers employed during the interval of the coincidences.† This correction is always additive when the mean of the thermometers is above 62°: but in all other cases it is subtractive.

With respect to the correction for the pressure of the atmosphere, as indicated by the barometer, I would remark that the usual formula, hitherto employed for this purpose, is exceedingly defective; inasmuch as it does not include the effect of the air, carried with the pendulum, when in motion. M. Bessel was the first to point out this to modern experimentalists: and it has since been shown that the effect of this newly discovered principle cannot be previously computed, but must be ascertained by actual experiment for each pendulum.

* See his *Account of Experiments, &c.*, page 207. I ought, however, to remark that Captain SABINE has, in a Paper inserted in the *Phil. Trans.* for 1829, page 238, stated that the value which he there deduced ought to be somewhat increased when the proper correction for the buoyancy of the atmosphere is applied to the reductions. In fact, that the rate of expansion would then be ·00001000; or the correction equal to 0·43 vibration for each degree of Fahrenheit. In a subsequent volume of the *Phil. Trans.* (for 1830, page 252) he has assumed the correction equal to 0·44 vibration: so that it seems he does not consider this element as sufficiently well established. Captain LEUTKE assumes 0·458 vibration.

† See the note in page 24.

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In a paper inserted in a recent volume of the *Phil. Trans.* (1832) I have given the detail of a variety of experiments made on different pendulums, of various forms and construction, by swinging them in vacuo, and also under the full pressure of the atmosphere, for the express purpose of determining the correction in question. Amongst those pendulums are the four which form the subject of the present Report. As a ready access to that Paper may not always be at hand, I shall beg leave here to make some extracts from it, for the elucidation of this subject. I have there shown that the true correction for what has hitherto been called the "buoyancy of the atmosphere" is expressed by the formula

$$C \times \frac{\beta}{1 + \cdot 0023\ (t - 32^\circ)}$$

where β denotes the mean height of the barometer, and t the mean temperature during the given interval. With respect to the value of the constant C, it has hitherto been considered as wholly dependent on the specific gravity (S) of the pendulum; and consequently equal to $N \times \frac{\cdot 0000217016}{S - \cdot 001299}$. But, the experiments above alluded to evidently show that the *form and construction* of the pendulum also influence the results, which can only be accurately obtained by direct experiment. I have already stated that the mode which I pursued for determining the value of C was to swing the pendulum under the full pressure of the atmosphere, and also in a highly rarefied medium, nearly approaching to a vacuum. The apparatus which I erected for that purpose has been fully described in the Paper inserted in the *Phil. Trans.* above alluded to: I shall therefore now state only the results of that enquiry with respect to the pendulums in question.

Let N′ denote the number of vibrations made by a pendulum in a mean solar day (corrected in the usual manner for the rate of the clock, the arc of vibration, and the temperature of the room, *but not for the height of the barometer*), β' the height of the barometer, and t' the height of the thermometer, when the pendulum is swung under the full pressure of the atmosphere: and let N″, β'', t'' denote respectively the same quantities when it is swung in a highly rarefied medium.* Then will $\frac{N'' - N'}{\beta' - \beta''}$ express the true correction for one inch pressure of the atmosphere at the temperature of t°; where $t^\circ = \frac{1}{2}(t' + t'')$:

* The mean temperature of the *inside* thermometer (which is the one used in the computations) must be increased by $0^\circ \cdot 75$, when the experiment is made in the *exhausted* receiver; to compensate for the effect produced on the thermometer by the removal of the atmosphere.

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which, being multiplied by $1 + \cdot0023\ (t° - 32°)$ will give the true constant C, equal to

$$C = \frac{N'' - N'}{\beta' - \beta''} \times \left[1 + \cdot0023\ (t° - 32°)\right]$$

Now, the values of N″ and N′, for the two knife edges of the iron and copper pendulums, may be deduced from the values given in Table VI. in the Appendix: for, we have only to deduct the correction for the barometer, from the number of vibrations given in the last column, and the difference will show the value of N″ or N′, as the case may be. The other quantities in the above formula are easily deduced. At the end of Table VI. above referred to, under the head of Experiments made at London after the voyage, with the iron and copper pendulums, will be found some that were made in the vacuum apparatus already mentioned, for the express purpose of determining the constant C above alluded to. Four double sets were made on each knife edge of each pendulum; and the mean of the respective sets has been taken as the value of the constant for the given knife edge. The following short table will show how these values have been obtained for each knife edge; as well as the references to the numbers of the experiment in the Appendix, where the detail will be found. In some few cases, two or more experiments, made under the full pressure of the atmosphere, have been united with one made in vacuo: the numbers, referring to such united experiments, are enclosed in a parenthesis, for the sake of distinction. As my vacuum apparatus was not sufficiently large to contain the brass pendulums No. 10 and No. 11, I have deduced the constant C, for those pendulums, from the experiments made by Captain Sabine on pendulums of exactly the same form and construction, in a vacuum apparatus erected at the Royal Observatory at Greenwich; an account of which is given in the *Phil. Trans.* for 1829, page 207. The references to those experiments are given in Roman numerals.

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Elements for deducing the constant C.

Pendulums.		No. of Experiment.	N″−N′	β′−β″	1+·0023(t°−32°)	C
Brass		I.	7·380	22·866	1·09252	·35261
		II.	9·065	27·888	1·08567	·35290
		III.	9·540	27·516	1·00963	·35005
		IV.	9·165	26·141	1·00095	·35093
		V.	10·380	29·114	1·01077	·36016
		VI.	5·705	16·090	1·00963	·35797
					Mean =	·35410
Iron	A	3— 4	12·574	29·054	1·08826	·47097
		5— 6	12·463	28·874	1·08631	·46887
		7— 9	13·052	28·709	1·05744	·48074
		8—10	12·906	28·852	1·05853	·47350
					Mean =	·47351
	B	3— 4	13·617	29·058	1·08976	·51067
		5— 6	12·009	28·753	1·08746	·49162
		7— 9	13·535	28·266	1·05662	·50595
		(10, 11)— 8	13·283	27·993	1·05733	·50170
					Mean =	·50248
Copper . . .	A	(3, 4)— 5	11·020	29·097	1·08544	·41110
		(7, 8)— 6	11·062	28·859	1·08329	·41523
		9—10	11·036	28·921	1·05192	·40238
		(12, 13)—11	11·262	28·618	1·04666	·41182
					Mean =	·41013
	B	(3, 4)— 5	11·648	28·900	1·07765	·43335
		(7, 8)— 6	11·476	28·516	1·07452	·43243
		(9, 10)—11	11·809	28·933	1·05076	·42887
		(13, 14, 15)—12	11·596	28·224	1·05212	·43237
					Mean =	·43175

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The true correction*, therefore, for the reduction to a vacuum (at the freezing point of water), for each of these pendulums, according to the mean height of the barometer β, and the mean height of the thermometer t, will be

$$\left.\begin{array}{ll} \text{Brass} \ldots = & \cdot 35410 \\ \text{Iron} \ldots & \left\{\begin{array}{ll} \text{A} = & \cdot 47351 \\ \text{B} = & \cdot 50248 \end{array}\right. \\ \text{Copper} \ldots & \left\{\begin{array}{ll} \text{A} = & \cdot 41013 \\ \text{B} = & \cdot 43175 \end{array}\right. \end{array}\right\} \times \frac{\beta}{1 + \cdot 0023\,(t - 32^\circ)}$$

And it is agreeably to this formula that the values given in Table VI. in the Appendix, under the head of "Corrections for the barometer," have been computed†. This correction is always additive.

It appears that, at Staten Island, on the 10th of November, after Captain FOSTER had completed his first series of experiments with the pendulum No. 10, he discovered that the barometer which he had been using in these experiments, and also in the experiments previously made at Monte Video, was erroneously divided, and indicated the height of the mercury 0·13 inch too little. He therefore substituted another barometer in all his future experiments. It becomes therefore necessary to add a correction to his two series of experiments at Monte Video and to his first series at Staten Island, for such error, in order to make the whole comparable. This has been done under the title of "Correction for error of barometer." I would here also remark that no correction has been made for the capillary attraction of the tube of the barometer; as I am ignorant of the exact diameter of the tube used by Captain FOSTER. If it was a mountain barometer, the correction for the height of the mercury might amount to $\frac{1}{10}$ of an inch; in which case, the correction would vary from 0·04 to 0·05 vibration: and which, being so small a quantity, may be safely neglected. But, if it was a barometer, having a diameter of 3 or 4 tenths of an inch, the correction would not amount to one fifth of that quantity. In fact the want of this correction will make no difference in the *comparative* results at the different stations; unless indeed we include the experiments made in London, where a standard barometer was used: and even then it would be almost insensible.

* Rigid accuracy is not absolutely necessary in determining these constants, when they are required for *comparative* results, as in the present case. See Captain SABINE's remarks on this subject in *Phil. Trans.* for 1829, page 237.

† For the purpose of such computations I furnished Mr. RICHARDSON with a separate logarithmic table of each of these values for every requisite degree of the thermometer: so that he had only to add the logarithm of the height of the barometer, to such tabular logarithm, in order to obtain the logarithm of the correction required.

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It may be proper here to state that Captain Sabine's experiments were made on two different pendulums; and as the results accord very well together, it is evident that no great error can arise from assuming the constant, above adduced, as the true value for a pendulum of that kind. Captain Sabine has expressed his result in a different manner; viz. by stating it to be equal to 1·655 times the amount of the correction deduced according to the old hypothesis, and where the specific gravity of the brass, of which the pendulum is made, is assumed equal to 8·60. It is true that Captain Kater states that the specific gravity of the first pendulum which he made of this kind was 8·61 (see *Phil. Trans.* for 1819, page 354): but this is greater than that of any brass which I have yet found, and greater I believe than what is usually met with: it is even more than the specific gravity of his convertible pendulum, which was formed of similar materials, and which was only 8·248 (see *Phil. Trans.* for 1818, page 63): and considerably more than the invariable pendulum sent out to Sir Thomas Brisbane, which was assumed equal to 8·0 only (see *Phil. Trans.* for 1823, page 311).* The values, above deduced from actual experiment, are the only ones that can be properly used in the computations: and the true *factor* of the old correction can only be ascertained by a correct determination of the specific gravity of the pendulum actually employed on the occasion.

The correction for the height of the pendulum above the mean level of the sea is a constant quantity at each station; and is therefore applied to the mean result of the several series of experiments with each pendulum. The formula used is

$$\frac{N}{R} \times h \times x$$

where R denotes the radius of the earth at the given station, and h the height of the station above the mean level of the sea, both expressed in feet; and where x is an unknown quantity determinable from theory, supposed by Dr. Young to vary from 0·50 to 0·75. See his Paper on this subject in the *Phil. Trans.* for 1819, page 98, where he states that if we suppose the mean density of the earth to be 5·5, and that of the surface only 2·5, the correction for a tract of table land will be reduced to $\frac{2}{3}$ of the whole. As this condition probably corresponds most nearly with the several places visited in this voyage, I shall assume $x = \cdot 666$.

Assuming, therefore, that the equatorial semidiameter of the earth is 3962 miles, or 20,919,360 feet, and that the compression of the earth is $\frac{1}{300}$, and

* The specific gravity of the pendulum sent out to Mr. Goldingham, at Madras, was found, by the Assay Master of the Mint there, to be only 7·966.

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assuming also, as before, that N may, in all the present cases, be taken equal to 86100, we shall have

$$\frac{N}{R} = \cdot 00412$$

a constant quantity for all the stations in the present voyage.* So that, by multiplying this quantity by $\frac{2}{3}$ of the height of the station above the mean level of the sea, we shall have the required correction, which is always additive.

Anomalies of the knife edge suspension.

Previously to my entering on the detail of Captain FOSTER's experiments, it will be necessary to make a few remarks on certain discordancies which attend the present mode of suspending the pendulum by means of a knife edge; as they may probably tend to explain some apparent anomalies that have occurred not only in these experiments, but in all those in which I have had any concern. I have already noticed some of these discordancies in the Paper inserted in the *Phil. Trans.* for 1832, formerly alluded to: the substance of which I shall beg leave to repeat in this place.

It has been shown by Captain SABINE† that, in a pendulum with a knife edge, a considerable difference may arise in the results, if it be used with *different planes:* but it does not appear to have occurred to any one, versed in these experiments, that a much greater difference than that which he has recorded may arise from using the *same* knife edge with the *same* plane. This fact has probably hitherto escaped detection, from the peculiar manner in which pendulum experiments are usually conducted: for, on examining the detail of most of those experiments, it will be found that after the pendulum at any one station has been placed in its Y's, it has never been removed therefrom, but merely raised and lowered again as occasion may require (by means of a lever attached to the frame), till it has been ultimately dismounted, and packed up for another station; whereby any anomaly that might otherwise have occurred is thus avoided, and consequently escapes detection. Experiments, however, of this kind, ought to be varied in every possible way, in order to guard against any unsuspected source of error.

* Except at the top of the Green Mountain in Ascension Island; where the height is so considerable that it is necessary to take the correct quantity, which is ·0041055. And here indeed it may be a question as to the value to be assumed for x.

† See his *Account of Experiments, &c.* page 195.

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When Captain Basil Hall returned from his voyage to the Pacific Ocean, where he had undertaken to swing the pendulum at various places, it was found that the number of vibrations which the pendulum made, on his arrival again in London, differed by 0·97 (or not quite a second of time) in a mean solar day, from the number of vibrations made by the same pendulum previous to his departure: and various causes were assigned for (what was called) so great and so singular a discordance;* for, I believe, at that time the results with the invariable pendulum were considered almost as infallible. But, in the midst of this enquiry, it seems to have escaped any particular observation that a greater difference had actually occurred during the voyage at St. Blas; where the two series (much longer in duration than those taken in London) differed from each other 1·15 vibration. It is true that we have a few instances of a contrary nature, where the pendulums, on their return home, have told precisely the same story as they did when they were sent off; and, in the case of the two pendulums that were taken out by Captain Sabine, *their coincidence during the whole of the voyage was very remakable,* since the greatest variation from the mean did not exceed 0·32 at any one of the stations;† but, these I consider rather as singularly favourable circumstances in his particular case, than as tending to invalidate the results of other experiments. In the voyage of Captain Freycinet, who took out three separate pendulums, we find a variation in the difference between them, amounting to several seconds in a day. Thus, at the Isle of Guam the difference between pendulums No. 1 and 2 was 1180·162 vibrations; whereas at the Isle of Rawâk the difference was only 1173·693; being a variation of 6·469 vibrations. At the Isle of France the difference between pendulums No. 2 and No. 3 was 1012·326 vibrations; whereas at the Isle of Rawâk the difference was only 1008·557; being a variation of 3·769 vibrations. And at the Isle of France the difference between pendulums No. 1 and No. 3 was 164·948 vibrations; whereas at the Isle of Guam the difference amounted to 169·833; being a variation of 4·885 vibrations in a mean solar day.‡ Captain Duperrey also, who took out two of these same pendulums (No. 1 and No. 3), in a subsequent voyage found the difference between them at Paris, prior to his departure, 168·450 vibrations; whereas at the Malouine Islands it was 169·652 vibrations; and on his return to Paris the difference was only 167·660; being a variation of 1·992 vibration between these two places; and a variation

* *Phil. Trans.* for 1823, page 287. † *Account of Experiments, &c.* page 189.

‡ *Voyage autour du Monde*, par M. Freycinet, (Observations du Pendule,) page 22.

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of 0·790 vibration at Paris before and after the voyage.* Now in all these cases their ought to be little or no variation in the difference between any two of the pendulums; neither would there be if we could ensure the making of the experiments precisely under the same circumstances; and no blame can be attached to those zealous officers, surrounded as they must be with difficulties of every kind for carrying on such delicate experiments.† In fact, amongst the multitude of experiments that I have myself made, I have seldom found, after I had *dismounted* a pendulum, and then replaced it (even on the same day, under all the favourable circumstances of equality of temperature, &c., and with all the conveniencies of manipulation), that I could make it tell the same story in the next series of experiments. Even the same pendulum, furnished with two different knife edges rendered synchronous or nearly so, similar to the iron and copper pendulums taken out by Captain FOSTER where the trifling difference in the results of each pair of knife edges ought, after proper reductions, to be a constant quantity, will frequently differ by an amount much greater than can be attributed to the errors of observation.

The fact, I believe to be, that the pendulum furnished with a knife edge and agate planes, as at present constructed, is a very inadequate instrument for the delicate purposes for which it was originally intended: and a more rigid examination and adjustment of that part of the instrument are requisite, before we can depend on the experiments made with it, either for the determination of the length of the seconds pendulum, or even for the comparison of results obtained in different parts of the world. The knife edge is seldom or never perfectly straight: the planes are seldom or never perfectly true: at least, I have never found more than one so, amongst the number of those on which I have experimented. The consequence is that, as there is generally a little play in the Y's, the knife edge is not always let down on the same parts of the agate plane. This may be best detected by holding a lighted candle behind the knife edge when it is resting on the planes: by which method the smallest inequalities in the points of contact are readily discernible. But the fact is rendered still more evident by reversing the pendulum in the Y's and taking a set of coincidences in that position, when a sensible difference in the result generally takes

* *Connaissance des Tems* for 1830, page 88.

† I shall show, in the sequel, that the greatest variation from the mean of the differences between two given pendulums, taken out by Captain FOSTER, was about one vibration a day; except in the case of the copper pendulum, at Staten Island, when it amounted to nearly two vibrations.

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place. Amongst the numerous pendulums in my possession, I have not met with more than one, that does not differ in the results by an appreciable quantity, when the pendulum is reversed in the Y's, or turned half round in azimuth. If the knife edge and planes were perfectly correct and true, there ought not to be any difference in the results, whichever side of the pendulum is placed fronting the observer: how then are we to account for a difference of upwards of two vibrations in a day, which actually occurs in one of the four pendulums taken out by Captain Foster! The following short table will set this matter in a clearer point of view, and show the real difference which I have found to take place in the results, merely by reversing the face of the pendulum.

Pendulum.		Difference.
Brass	10	none
	11	0·91
Iron	A	0·12
	B	2·04
Copper	A	0·30
	B	0·17

As the experiments, from which these results are deduced, were made for the express purpose of detecting any discordance arising from the position of the knife edge on the agate planes, they were followed up (as far as each pendulum is concerned) in immediate succession; alternately turning the face of the pendulum at the end of each experiment. It is needless to swell this Report with a detail of the whole of the experiments that were made on these occasions: more especially as I have entered more minutely into this case of the knife edge B of the iron pendulum, which presents so remarkable a discordance, in the Paper in the *Phil. Trans.* above alluded to. From a review of the whole question, however, it is clear that different experiments, even with the same pendulum, are not strictly comparable with each other, unless we can either ensure the perfect accuracy of the knife edges and planes, or provide a method of making the vibrations, in all cases, from the same part of the knife edge, and from the same part of the plane: or, in other words, that the knife edge and planes shall, in all cases, touch each other at the same points of contact.

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Since the Paper, above alluded to, has been printed, I have pursued this enquiry still further; and I find that it is not necessary to reverse the pendulum in order to discover discordancies equal to many of those above recorded. For, the slight range which the pendulum has in the Y's of the lever (by which it is raised from, and let down upon, the agate planes) is oftentimes sufficient to cause an appreciable difference in the results. And as I am not aware that any particular attention has hitherto been given to the adjustment of this part of the apparatus, we may probably trace some of the discordancies to this cause: for, I believe that, in general, the knife edge is placed in the Y's at random; or without much regard whether it deviates a little more towards one end than the other. The consequence is that, although the range is very small (scarcely more than $\frac{1}{20}$th of an inch, in those which I have seen) the knife edge, after the pendulum has been dismounted and replaced, probably does not touch the agate planes in precisely the same points as before: and consequently a discordance in the results occurs. Numerous experiments with various pendulums, and under a variety of circumstances, have convinced me of this important fact.

One of the most severe tests of the uniform and accurate performance of a pendulum, to which it can be subjected, as well as the most simple and easy to accomplish, is to swing it with another of a similar kind; and to mark the differences in the intervals of their coincidences, at various times, and under various circumstances. This method was first practised by Professors AIRY and WHEWELL, in their pendulum experiments at the Dolcoath mine, in the years 1826 and 1828. In such experiments, if the two pendulums be set off at an equal arc (which it is not difficult to do) we have merely to note the intervals of the coincidences, since no corrections are requisite; and a portable chronometer (the rate of which is not even necessary to be known) may be employed in recording the time. The two pendulums, which I employed for this purpose, were the two brass invariable pendulums No. 10 and No. 11, above mentioned: but as the intervals of their coincidences were inconveniently long, I affixed to No. 11 (half way between the knife edge and the centre of oscillation) two pieces of plate brass, about the width of the pendulum, and weighing together about 1460 grains, in order to shorten the intervals. The pendulums were distant from each other about 5 inches: and a plate of glass, about 15 inches square, was interposed between the bobs (in order to prevent any influence from the motion of the air), on which plate of glass two strips of black paper

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were pasted, for the purpose of a diaphragm.* The time of the coincidences was estimated (and sufficiently near for this enquiry) by the beat of a clock, placed in the same room; for any slight error of this kind would be divided by the total number of coincidences. One thermometer was hung in front of the pendulums, and another behind, each about 4 inches from the nearest pendulum: and I seldom, or never, observed any difference between them.

It is in this manner that I have been enabled to detect many minute sources of discordance, and to trace their origin with comparatively little trouble or inconvenience; and have afterwards verified them, and determined their amount in the usual manner. The slightest movement of the knife edge on the planes is oftentimes the cause of a perceptible discordance: and even without any alteration in the position of the knife edge, we find occasionally, on the same day, and without any apparent cause, changes which cannot be satisfactorily accounted for. Every artist, employed in making pendulums, ought to have a standard of this kind with which he should compare them before they are sent off. And in any future experiments, similar to those which are the subject of this Report, where two pendulums of the same construction are employed, they ought to be thus compared *before* and *after* the voyage, in order to ascertain whether either of them has varied in its relative rate during the expedition.

The following little table will show the several comparative results obtained by placing the pendulums on the agate planes in the following order: 1st, by bringing the knife edge close to the *front* notch of the Y's; 2nd, by placing it, as nearly as possible, in the *middle* of the agate planes; and 3rd, by pushing it close to the *back* notch of the Y's.

Pendulums.		Knife edge placed at the		
		front.	middle.	back.
Brass	10	No perceptible difference.		
	11	86122·30	86123·17	86122·74
Iron	A	86220·50	86220·60	86219·91
	B	86221·35	86221·71	86220·93
Copper	A	86224·01	86223·77	86223·77
	B	86223·44	86222·99	86222·99

* Only one edge of the pendulum was observed: and the slit or opening of this diaphragm was reduced as narrow as was consistent with distinct observation: for, as the two pendulums moved in arcs of the same magnitude, it was otherwise difficult to determine the precise time when they were simultaneously in a vertical position.

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The first of these pendulums (No. 10) is the most perfect of the whole; for, on whatever part of the agate planes the knife edge is placed, the results are the same, or so nearly so that the difference is not worthy of notice. On the contrary, the similar pendulum (No. 11) is affected by almost every change of position however slight: and we here find a difference of nearly one vibration in a day, according to the manner in which the knife edge is placed on the Y's (similar to what takes place on reversing the pendulum as already mentioned, and probably arising from the same cause); thus indicating some occult inequality in the knife edge or the planes: although nothing of the kind is discoverable by inspection. The iron pendulum exhibits an inequality of 0·69 vibration on the knife edge A; and of 0·78 vibration on the knife edge B: and the copper pendulum exhibits an inequality of 0·24 vibration on the knife edge A; and of 0·45 vibration on the knife edge B; between their greatest and least values.

Now, these experiments evidently show something wrong, either in the knife edges or the planes: but, although, to every outward appearance it is difficult to determine where the defect lies, yet in all probability the principal source of error is in the knife edge. The *straightness* of the knife edge cannot well be examined after it is fixed to the pendulum: and even, should it have been ascertained to be perfectly correct prior thereto, the effect of the screws, by which it is attached to the knee pieces, may, unless great caution be used by the artist, disturb the straight line and produce discordancies: so that great nicety is required in this part of the apparatus. With respect to the agate planes, I should propose that, in future, they be slightly *rounded;* so that the knife edge should always rest on the protuberant parts. Then, if the play in the Y's were removed, or if the knife edge were always brought up to one side, or the other, of the agate planes, the knife edge and agate planes would, in all cases, touch each other in the same points; which is all that is required either in the invariable or convertible pendulum, when the object is merely to obtain comparative results. But, when the convertible pendulum is employed for the purpose of determining the absolute length of the seconds pendulum, the points of the knife edge which touch the agate planes should be marked; and the distance between the marked points of the two knife edges must be taken as the correct distance, from which to deduce the length of the pendulum. With these precautions, and those just alluded to in the preceding page, we might rely with confidence on the results obtained with this instrument, as far as the instrument itself is concerned.

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But, to return once more to the present subject of enquiry, it appears that there are still some sources of discordance which are independent of any imperfection either in the knife edges or the planes; and which, although small, will still baffle us in all our attempts at extreme accuracy. The following experiments were made with the two invariable brass pendulums No. 10 and No. 11, by swinging them together in the manner above related, for several successive days. No alteration whatever was made in the position of their knife edges on the agate planes: nor were they ever touched or disturbed during the whole period, except by raising the knife edges off the planes, by means of the lever attached to the frame. The same points of the knife edges consequently always touched the same points of the planes; the pendulums always vibrated in an atmosphere of the same temperature and pressure; and, in fact, all the circumstances were alike to each pendulum in every case. The intervals of their coincidences therefore ought always to have been the same. The following are the results on the several days. The time employed each day was about 4 hours: in which interval the pendulums made about 26 coincidences. The state of the thermometer and barometer are annexed: the temperature seldom varied more than one degree during any one set of experiments.

1833.	Intervals.	Therm.	Barom.
	s	°	
April 8	554·07	50·1	29·97
8	4·04	52·5	30·00
9	3·87	50·6	30·09
10	3·76	51·5	29·83
11	3·77	50·8	29·39
12	4·03	48·5	29·37
13	4·36	48·1	29·72
14	4·23	48·4	29·44
15	4·15	47·0	29·47
17	4·08	45·3	29·57
Mean =	554·04		

From these experiments it appears that a difference of $0^s{\cdot}60$ may occur in the time of the mean interval of the coincidences of these two pendulums, under the most favorable circumstances. This difference is in this case equivalent to 0·34 vibration in a mean solar day: and, therefore, to such an amount may the

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results be affected without any apparent cause. For, I consider the mode of observing the coincidences, especially when all the four phenomena are noted (that is, the two disappearances, and the two reappearances of the disc), to be absolutely perfect, and not subject to any appreciable error. And, as all the other sources of discordance are common to both pendulums, we have thus a method of estimating the probability of error in pendulum experiments, as far as the pendulum alone is concerned.

I now come to discordancies of quite another kind: such as, instead of being of a temporary or variable nature, assume a more permanent and durable character. On receiving the pendulums from the Admiralty, after the return of the *Chanticleer* to England, I was desirous of putting on record, as early as possible, the number of vibrations made by each of them in a mean solar day; and for this purpose made a regular series of experiments on them all: but as my remarks now refer only to the two brass pendulums No. 10 and No 11, I shall confine my observations to them.

It will be seen, by Table VI. in the Appendix, that the mean of 7 sets of experiments, occupying 34·02 hours in the month of July, gave the number of vibrations, reduced to the level of the sea, equal to 86016·38 for the pendulum No. 10: which result was confirmed by 4 sets of experiments, occupying 9·13 hours, at a different season of the year, in the month of January following; the general mean of the whole being 86016·42. But, the number made by Captain FOSTER, prior to his voyage, was only 86014·83 vibrations, from a mean of 8 sets of experiments, occupying 23·74 hours: being a difference of 1·59 vibration. All these sets of experiments are very accordant, and do not indicate any source of error: and, as this pendulum appears to have been the most perfect in its construction, of all those that were taken out by Captain FOSTER, the discordance is the more remarkable. I cannot discover any clue as to the time, or place, when this alteration in the rate took place: although I suspect, from what will be mentioned in the sequel, that it occurred subsequent to the close of Captain FOSTER'S experiments.

The next anomaly is of a more singular nature; and although it does not affect any of Captain FOSTER'S results, yet it is worthy of being placed on record, as affording another instance of the uncertainty which occasionally attends enquiries of this nature. It relates to the pendulum No. 11; which, as we have already seen, exhibits some discordancies, according to the position of the knife edge on the agate planes; but always within certain limits. On

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making similar experiments with this pendulum, on its return to England, I found the results in very good accordance with those made by Captain Foster, prior to his voyage: the difference being only 0·13 vibration in defect. With this result I was satisfied: the pendulum was dismounted, and replaced in its case; and there it remained, untouched by any person, till the opposite season of the year, in the month of January following; when I was desirous of repeating the experiments, as I had already done with the pendulum No. 10. What then was my surprise to find that this pendulum, instead of making about 86118½ vibrations in a day, as it did before and after the voyage, made now upwards of 86123¼: being a difference of more than 4¾ vibrations a day, without any assignable cause. The trifling variations caused by the position of the knife edge on the planes, as already alluded to, vanish before this enormous and permanent difference. I varied the experiments in all manner of ways; I changed the position of the knife edge on the planes; I reversed the face of the pendulum; I swung it on the planes belonging to the pendulum No. 10: but all to no purpose. The variations in the results were confined within the limits of about one vibration a day; as in the former cases. The alteration of the rate is *permanent;* as I have since verified from time to time on various occasions, and under a variety of different circumstances: thus adding another instance to those already enumerated, of the delicacy and difficulty attending enquiries of this kind. No alteration in the form or appearance of the knife edge is perceptible: nor have I been able to detect any thing about the pendulum that can have produced the change in question. I thought it might probably have got bent by some accident (for I have found by experience that the bob is not sufficiently heavy to straighten the bar if such an event should occur), but on suspending a fine wire beside it, in different positions, I could not discover any imperfection of this kind.*

* Since this Report has been delivered in, I have taken off the knife edge of this pendulum; and at the back thereof, at one end, I observed a good deal of *rust*. This I carefully removed, without touching any other part of the knife edge: and having replaced the knife edge, I took two sets of coincidences with the pendulum thus restored. The number of vibrations were now about 2 less in a mean solar day than they were before: but still, I could not reduce them to what they were in Captain Foster's hands. The anomaly, therefore, depends also on other causes.

It may be proper here to state, that as Mr. Maclear, the newly appointed Astronomer to the Observatory at the Cape of Good Hope, has proposed to swing this pendulum, on his arrival at that station, I have (August 1833) caused it to be thoroughly cleaned, and certain alterations to be made in it; which will be explained when comparative results have been obtained with it in its new state.

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Places at which the Pendulums were swung.

The number of places, at which Captain FOSTER swung the pendulums, amounted in the whole to 14: extending from London in the northern hemisphere, to South Shetland in the southern hemisphere. At all these places, each of the brass invariable pendulums No. 10 and No. 11, was swung; at six places the iron convertible pendulum was swung on both knife edges; and at eight places the copper convertible pendulum was swung on both knife edges. And here it may be proper to remark that as the iron and copper convertible pendulums were each furnished with two knife edges, marked A and B, Captain FOSTER may be considered as having taken out *six* independent and invariable pendulums; each of which furnishes a distinct result, comparable with the rest; and by this means we are enabled to detect anomalies that otherwise would have escaped notice. In fact, no voyager ought to take out less than three independent pendulums: for, in the case of a discordance between any two of them, a third is requisite to clear up the difficulty.*

The total number of experiments made with these pendulums was 1017 sets: out of which (if we except some of those made at South Shetland, of which I shall speak more particularly in the sequel) I have found it requisite to reject only three; namely, one at Cape Horn, one at the Island of Ascension, and one at Para: all of which were marked as doubtful, at the time, by Captain FOSTER.† And, as each of the various sets made during the voyage, consisted, on an average, of nearly 20 coincidences, the total number of coincidences taken by Captain FOSTER at the fourteen stations, was about 20000, and occupying about 2710 hours. To which should be added the several sets which I have myself made on these pendulums, since their return to this country, occupying upwards of 470 hours more. So that the total time occupied in experimenting on these pendulums has been upwards of 3180 hours: thus furnishing a series more extensive and varied than any ever before attempted by any individual; and which must have its due weight in all discussions relative to this important enquiry.‡

* See the note in page 11.

† The rejection, however, of these does not materially affect the results in either case.

‡ The total time occupied by Captain SABINE in making the pendulum experiments at the thirteen different stations which he visited, during his two voyages, in the northern and southern hemisphere, was only 598 hours: which period includes the 62 hours employed in determining the rate of expansion from the pendulum experiments. The total time occupied by Captain FREYCINET,

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The following table exhibits a list of the places where the pendulums were swung by Captain Foster, in the order in which they were visited by him: together with the pendulums employed at the several stations; and the number of hours occupied by the experiments at each place. The three places, which are marked with an asterisk, are those which were visited by Captain Sabine, in his voyage of experiment in the years 1822 and 1823.

No.	Stations.	Brass.		Iron.		Copper.		Total Hours.
		No. 10.	No. 11.	A	B	A	B	
1	London, before the voyage .	23·74	21·82	. .	. .	. .	. .	45·56
2	Greenwich	25·08	22·95	. .	. .	. .	. .	48·03
3	Monte Video	64·83	41·63	. .	. .	. .	. .	106·46
4	Staten Island	120·50	69·83	28·64	31·40	43·05	43·11	336·53
5	South Shetland	59·91	173·34	41·34	42·86	25·72	28·49	371·66
6	Cape Horn	72·97	71·85	. .	. .	. .	. .	144·82
7	Cape of Good Hope	70·96	52·78	63·76	65·47	57·34	58·96	369·27
8	St. Helena	59·13	72·18	. .	. .	27·18	36·24	194·73
9	Ascension Island . . . . . *	107·84	76·66	26·04	23·83	36·67	35·57	306·61
10	Fernando de Noronha . . .	52·41	46·27	. .	. .	. .	. .	98·68
11	Maranham . . . . . *	48·75	41·73	. .	. .	41·94	32·05	164·47
12	Para	45·53	57·17	30·70	33·24	36·78	36·07	239·49
13	Trinidad . . . . . *	50·21	43·13	22·89	23·30	31·05	29·90	200·48
14	Porto Bello	47·15	35·73	. .	. .	. .	. .	82·88
	London, after the voyage . .	43·15	40·27	77·36	90·60	115·60	107·01	479·99
	Total number of hours .	892·96	867·34	290·73	310·70	415·33	407·40	3183·66

I shall now proceed to state the results obtained with these pendulums, at the several places in succession: together with such other circumstances connected therewith, as may tend to elucidate and explain the principal object in view; which is to determine the figure of the earth from the variation in the force of gravity, as indicated by the difference in the number of vibrations made in a mean solar day, by the different pendulums, at the various stations.

at the nine different stations which he visited, was only 367 hours. And the total time occupied by Captain Duperrey, at the six different stations that he visited, was only 256 hours. So that Captain Foster's experiments are five times more extensive than Captain Sabine's, and full $2\frac{1}{2}$ times more extensive than *the whole of the above experiments united:* and they have also the advantage of having been made with a greater variety of pendulums. These remarks are not made for the purpose of any invidious distinction, but to show the comparative value of Captain Foster's labours.

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The geological features of the country, around the several pendulum stations, are taken from the official reports thereon, made to Captain FOSTER by Mr. WEBSTER, the surgeon of the *Chanticleer*.

1. *London (before the voyage).*

The experiments at London, before the voyage, with the brass invariable pendulums No. 10 and No. 11, were made by Captain FOSTER at the house of the late HENRY BROWNE, Esq., of Portland Place; in the same room, and on the *same support* as that on which Captain KATER made the experiments with his convertible pendulum as described in the *Phil. Trans.* for 1818, page 41, and with his convertible pendulum as described by him in the *Phil. Trans.* for 1819, page 377. This circumstance I well remember; having been present at some of the experiments: but, in order to guard against any false impression on this subject, I made particular enquiry of Mr. THOMAS JONES, who furnished the instruments: and who has confirmed me in my recollection, by assuring me that the triangular stands were not used on that occasion; and moreover that WILLIAM SHIPWRIGHT, his workman, recollects having fixed the agate planes to the above mentioned support. In fact, the brass pieces, to which the agate planes are annexed, are each of them pierced with screw holes for that *express and sole purpose*. I have been the more particular in alluding to this subject, as it appears to be the only case in which Captain FOSTER omitted the use of the triangular stands: but, in truth, the position of the clock at Mr. BROWNE'S house was such that the triangular stands could not be placed so as to make the requisite observations. And it is necessary to bear this circumstance in mind, when we come to compare the experiments made in London, with those made at Greenwich.

The experiments in London were made in January and February 1828. The local situation of Mr. BROWNE'S house has been described by Captain KATER: but, its elevation above the mean level of the sea appears to have been erroneously stated by him; since, according to Captain SABINE* it is 92½ feet, instead of 83 feet. The latitude of the station is 51° 31′ 8″ N. The direction of the line of motion of the pendulum was nearly true East and West. Eight sets of experiments were made with No. 10, and seven sets with No. 11. The details of the experiments are given in the Appendix: the results are as follow. And here I would remark, once for all, that in giving the tabular view of the results at each station, I shall arrange the columns in such manner, that they shall

* See SABINE'S *Account of Experiments, &c.*, page 343.

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respectively show,—1st, the pendulum employed; 2nd, the number of sets of experiments that have been made; 3rd, the total interval of time employed in making them, expressed in hours and decimal parts; 4th, the true number of vibrations made in a mean solar day, from a mean of the whole series, and all the corrections being applied; 5th, and lastly, the greatest differences (*plus* and *minus*) in the partial results, from this general mean.

Pendulums.	Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
				+	−
Brass 10	8	h 23·74	86014·83	0·18	0·08
Brass 11	7	21·82	86118·65	0·09	0·08

These results appear to be very consistent, and consequently very satisfactory: the greatest difference from the mean, in no case, amounts to any considerable quantity.

Captain Foster had not time to make any series of experiments on the iron and copper convertible pendulums, prior to his departure from London: but, as it was requisite that the two knife edges, of each of these pendulums, should be adjusted nearly to synchronism, I undertook to make the necessary corrections for that purpose. And here it may be proper to repeat the remark already made, that at that time the important discovery of M. Bessel, relative to the correction for the reduction to a vacuum, was but imperfectly understood in this country; and that it was not then known in what ratio the correction differed for the two knife edges of a convertible pendulum. The old correction therefore was adopted in making these adjustments; which will, for the most part, account for the difference now observable in the results with the two knife edges, when the true correction is applied.

The experiments were made by me, at my house in Tavistock Place, in the month of March 1828. The mode in which my apparatus is fixed, has been already described by me in the *Phil. Trans.* for 1832, page 403; but it may be proper here to state that the vacuum tube, there mentioned, had not then been constructed; and that the agate planes were screwed to the solid transverse beams there alluded to. The latitude of the place is 51° 31′ 26″: and the height of the pendulum, above the mean level of the sea, 101 feet. The direction of the line of motion of the pendulums was about N. 22° E., and S. 22° W. Eight sets of experiments were made with the knife edge A; and

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eight sets with the knife edge B, of the iron pendulum. Also five sets with the knife edge A; and five sets with the knife edge B, of the copper pendulum. The details of these experiments are given in the Appendix: the results are as follow.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	—
Iron	A	8	h 21·45	86219·64	0·84	0·84
	B	8	25·83	86220·80	0·55	0·38
Copper	A	5	11·45	86224·40	0·23	0·50
	B	5	13·53	86224·76	0·10	0·21

It is necessary here to state that these experiments cannot properly be compared with any that have subsequently been made with these pendulums; firstly, because they were made on my own agate planes, which have been re-ground and re-polished, during Captain Foster's absence: and secondly, because it appears, from what has been stated in page 16, that Captain Foster had subjected these pendulums to a process which may have altered their rates.

These experiments are, indeed, adduced merely for the purpose of preserving the connected history of the subject: and in fact they were roughly made, and undertaken solely for the purpose of adjusting, nearly, the two ends of the pendulum, and not with a view to any comparative results being deduced from them; as there was not sufficient time to execute the requisite series with accuracy.

Since the return, however, of these pendulums to London, experiments have been made not only with these pendulums (on their own agate planes) but also on the two brass invariable pendulums No. 10 and No. 11 (on their own respective planes) for the purpose of comparing the results with the experiments made during the voyage: an account of which will be given in the proper place.

2. *Greenwich.*

The experiments at this place were made in the month of February 1828, in the room usually set apart for the observation of the eclipses of Jupiter's satellites: and which is the same room as that used by Captain Foster prior to his expedition to the North Pole.* I had previously attempted to make some

* See *Phil. Trans.* for 1826, part 2, page 2.

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experiments there with the iron and copper pendulums; but I found the difference of temperature so great between the air at the top and at the bottom of the apartment, and the anomalies consequently so great, that, after pursuing the subject for 2 or 3 days, I gave up the point in despair. The fact is, that the slanting roof of the building is nearly perpendicular to the direct rays of the sun at that time of the year, and consequently the upper stratum is very warm: on the other hand, the floor being paved with stone, the lower stratum is comparatively cold. Added to which, a passing cloud will often cause a perceptible difference in the temperature; so that a variation in the thermometer is continually taking place: and I have sometimes during my experiments found the temperature of the upper and lower strata of air to differ ten degrees of Fahrenheit.

Captain Foster, however, being thus aware of the inconvenience, obtained permission from the Astronomer Royal to cover the roof of the building with a thick coating of straw; which rendered the temperature more uniform, as may be seen by a reference to the thermometers employed in his experiments. With this precaution, the several series of experiments are rendered comparable with those made at other places.

The latitude of Greenwich may be assumed 51° 28′ 40″ N.: and the height of the station, above the mean level of the sea, as 159 feet.* The direction of the line of motion of the pendulums was nearly true East and West. The pendulums, as well as the clocks with which they were compared, were attached to the triangular stands, already alluded to: a method adopted in all his subsequent experiments. Ten sets of experiments were made with the brass invariable pendulum No. 10; and ten sets with No. 11. The details are given in the Appendix: the results are as follow.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
Brass	10	10	h 25·08	86014·49	0·25	0·15
	11	10	22·95	86117·57	0·53	0·57

* This differs upwards of 20 feet from the height assumed by Captain Foster in his former experiments (see *Phil. Trans.* for 1826, part 2, page 22). But, since that time, Mr. Lloyd has found the height of the floor of the observatory, above the mean level of the sea, by actual levelling, equal to 153·83 feet (see *Phil. Trans.* for 1831, page 184): to which must be added the height of the pendulum above that floor, or 5½ feet.

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If we compare these results with those obtained at London, we find a *diminution* of 0·34 vibration in No. 10; and also a *diminution* of 1·08 vibration in No. 11. These are not only discordant in themselves, but differ very materially from the result of similar experiments made by Captain SABINE, for the express purpose of determining the difference in the number of vibrations made by a pendulum at London and at Greenwich; as detailed by him in the *Phil. Trans.* for 1829, pages 86 and 87: and who found an *increase* of 0·48 vibration in the results, on taking the pendulum from London to Greenwich. There are two modes in which we may account for the discordancy in Captain FOSTER'S results. In the first place, I have shown in a former part of this Report (page 32), that there is a difference of 0·91 vibration in the results with the pendulum No. 11, according to which face of the pendulum is turned towards the observer. That is, when the face of the pendulum, which has the maker's name and the number engraved on it, is turned towards the observer, this pendulum makes 0·91 vibration *more* in a mean solar day, than when the face is reversed. Now, although it was Captain FOSTER'S practice always to turn the same (engraved) face of the pendulum towards him, when placing it on the agate planes; and indeed to make all his experiments, as nearly as possible under the same circumstances; yet, notwithstanding our utmost precaution, mistakes will sometimes occur, as I have occasionally found in my own experiments; and more especially (as in the present instance) when we are not aware, at the time, that the error may be attended with any material difference of result. If therefore we suppose that Captain FOSTER inadvertently placed the pendulum so that the number, engraved thereon, was *behind* instead of in front, nearly the whole of the discordance is accounted for: since by adding 0·91 vibration to the results of pendulum No. 11, we have a diminution of only 0·17 vibration with this pendulum; the differences, between the results of the two pendulums, being then far within the errors of observation. And although such results would not agree with Captain SABINE'S determination, yet it makes Captain FOSTER'S experiments consistent with themselves; which is the only object I have in view in making these remarks.* I shall have occasion, in the sequel, to notice an apparently similar occurrence with the iron pendulum at Para.

* I am informed that the pendulum, which Captain FOSTER took out with him to the North Pole in the year 1824, is the same pendulum (No. 3) which Captain SABINE took out with him in his voyage of experiment; but furnished with a new set of agate planes. It would appear therefore that the difference in the number of vibrations made by a pendulum at London and at Greenwich is far from being minutely and satisfactorily determined. For in the month of April 1824,

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The other mode for accounting for the discordance is by supposing that, the knife edge being placed in the Y's at random, its position on the agate planes may have been so different at the two stations of London and Greenwich, that a difference of nearly the amount above mentioned, may have been caused by such circumstance. And I have already shown (page 34) that the knife edge of this pendulum is liable to such a discordance.

I lay no stress on the difference in the mode of supporting the pendulums at London and Greenwich (see page 41): because if the tripod stand affected one of the pendulums to this degree, its influence would not be wholly insensible in the results of the other.

3. *Monte Video.*

Captain Foster arrived at this station on August 15th, 1828, and left it on October 5th following. The pendulums were erected on Rat Island, situate within the harbour, in a house belonging to the Commandant; who, at some inconvenience to himself, not only very obligingly gave up the use of it to Captain Foster during his stay there, but also rendered him every assistance in his power. The floor of the apartment was taken up; and the pendulum apparatus rested on the bare ground. The island is about 200 yards in diameter, and about 50 yards from the beach: it consists of primitive rock, with mica slate and granite. The position of the station is in W. Long. $3^h\ 44^m\ 41^s$ and S. Lat. 34° 54′ 26″.* Its height above the level of the *river* in its mean state was 12 feet $7\frac{1}{2}$ inches: and, having no other information on this point, I have assumed 13 feet in round numbers as its height above the mean level of the sea.

Captain Sabine determined the number of vibrations made by that pendulum at Mr. Browne's house in London to be 86154·97, at the temperature of 62° (see his *Account of Experiments*, page 211): and, a few days after, Captain Foster determined the number of vibrations made at Greenwich, with the new agate planes, to be 86159·38, at the temperature of 50°; which being reduced to the temperature of 62°, will give 86154·30 vibrations (see *Phil. Trans.* for 1826, part 2, page 21). By which it would seem that this pendulum with the new planes made 0·67 vibration *less* at Greenwich than in London with the old planes: contrary to Captain Sabine's experience as mentioned in the text. When the proper corrections are made for the respective heights of the stations, there ought not to be a greater diminution than 0·16 vibration, from the mere effect of the difference of latitude. Probably the difference of the planes caused this remarkable difference in the results: as it appears from Captain Sabine's *Account of Experiments, &c.* (page 195) that this pendulum was materially affected by a change of planes.

* In giving the positions of the foreign stations, it may be proper to state here, once for all, that I have assumed them as deduced from Captain Foster's own determinations, unless otherwise expressed.

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The direction of the line of motion of the pendulums was N.E. and S.W. *true.* Twenty five sets of experiments were made with the brass invariable pendulum No. 10; and fifteen sets with No. 11. The details are given in the Appendix: and the following are the results.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
Brass	10	25	h 64·83	85950·27	0·80	0·92
	11	15	41·63	86053·21	0·43	0·52

These experiments are tolerably accordant: for although there appears a discrepancy of upwards of 1·7 vibration between the greatest and least values of the pendulum No. 10, yet it should always be borne in mind that, at these foreign stations, a great portion of the *partial* discrepancy which occurs, may be attributed to the difficulty of determining the correct rate of the clock from *day to day;* and which *partial* discrepancy is eliminated in the general mean. Neither the iron nor the copper pendulum was swung at this place.

4. *Staten Island.*

Captain FOSTER arrived at this station on October 25th, 1828, and left it on December 22nd following. The portable observatory was erected on, or near to, the isthmus between North Port Hatchett and South Port Hatchett. The ship's bucklers* were well bedded in the bare ground; and the apparatus placed thereon. The position of the station was in W. Long. $4^h\ 15^m\ 55^s$ and S. Lat. 54° 46′ 23″. Its height above the sea was about 16½ feet.† The direction of the line of motion of the pendulum was East and West, *by compass.* This island is extremely rugged; consisting of transverse ridges of mountainous hills, the principal constituents of which are greywacke, and quartz rock, with an intermixture of, and in some places a substratum of, clay slate. One of the

* A ship's *buckler* is a piece of wood through which the cable passes: it is about 2 feet square and 3 inches thick.

† Captain FOSTER says 20½ feet above low water, and 10½ feet above high water, spring tides, for the brass pendulums: and 23 feet above low water, and 12 feet above high water, spring tides, for the iron and copper pendulums. I have taken the mean of the whole: namely, 16½ feet. It appears that the iron and copper pendulums in general stood from about 1½ to 2½ feet higher than the brass pendulums: I know not on what account.

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ridges of these mountains, situate to the north of the observatory, is supposed to be upwards of 2000 feet high.* All the pendulums were swung at this station. Forty six sets (consisting of two series) were made with the invariable brass pendulum No. 10; and twenty six sets with No. 11. With the iron pendulum, we have eleven sets on the knife edge A; and twelve sets on the knife edge B. With the copper pendulum, we have sixteen sets on the knife edge A; and also sixteen sets on the knife edge B, each consisting of two series. The details of all these experiments are given in the Appendix: and the results are as follow.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
			h			
Brass	10	46	120·50	86029·89	0·85	1·06
	11	26	69·83	86134·38	1·51	1·07
Iron	A	11	28·64	86235·07	1·37	1·22
	B	12	31·40	86235·64	0·31	0·58
Copper	A	16	43·05	86240·86	0·67	1·08
	B	16	43·11	86237·67	0·67	0·84

There is some discordancy here in the relative values of the results given by the two knife edges of the copper pendulum; as the difference between the two ought not to be so great as is here indicated. Probably this has been caused by the position of the knife edges on the agate planes, as already alluded to in page 34: but, as I shall revert again to this subject, I shall not dwell farther on it in this place.

5. *South Shetland.*

Captain Foster arrived at this station on January 9th, 1829; and left it on March 8th following. The pendulums were erected on Deception Island, one of the cluster of newly re-discovered Shetland Isles. A description of this miserable and desolate island, with a map of the same (on which, the position of the observatory is delineated), is given in the first volume of the *Journal of the Royal*

* Mr. Webster also states that "at the N.W. extremity of the mouth, or entrance of North "Port Hatchett, a clay slate formation prevails, with cubical crystals of iron pyrites imbedded in it: "veins of white quartz traverse it in various directions, giving it a marbled hue and appearance: "associated with this tract are extensive beds of Graphite, or *Black lead, of a fine and good* "*quality:* the roofs of the large caves are composed almost entirely of this substance." Surely this latter article might be made available for the purposes of commerce.

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Geographical Society of London, page 62. "The principal part of the island is "composed of alternate layers of ashes and ice, as if the snow of each winter, "during a series of years, had been prevented from melting in the following "summer, by the ejection of cinders and ashes from some part where volcanic "action is still in progress: and that such is the case appears probable from the "fact of there being at least one hundred and fifty holes, from which steam was "issuing with a loud hissing noise, and which were visible from the top of one "of the hills immediately above the small cove where the *Chanticleer* was "secured." * * * "The hills, whose height was about 1800 feet, were prin-"cipally tufa, scoriæ, and a red brick-like substance: but, in some places, points "of obsidian and hard compact lava were seen." In erecting the pendulums, the loose cinders were cleared away till a solid foundation appeared, where the cinders seemed to be cemented with the ice. The ship's bucklers were then laid down, and the apparatus fixed thereon. The position of the station was in W. Long. $4^h\ 2^m\ 4^s$, and S. Lat. 62° 56′ 11″. Its height above *low water* was about 20 feet:* and, from the best information which I can obtain, it appears that the rise of the tide is only about 6 feet: so that we may perhaps safely assume 23 feet as the height above the mean level of the sea. The direction of the line of motion of the pendulums was N. 18½° W., and S. 18½° E. *by compass:* the variation of the compass is stated to be 22° East. Mount Pond, which lies N.E. of the station, is about 1800 feet high.

The climate at this place was exceedingly unfavourable for astronomical observations: and the frequent gales of wind and violent squalls that occurred, were very annoying. It was in one of these tremendous storms that Captain FOSTER lost his repeating circle, as already alluded to in page 9; the particulars of which are thus described in a letter to Captain BEAUFORT, dated February 14, 1830. "I hope their Lordships have acceded to my request, from the Cape of "Good Hope, for a repeating circle; and that I shall find it at Maranham. The "one I took with me was broken to pieces in so peculiar a manner, that I am "almost afraid to relate the circumstances, which are simply as follow. The "instrument was mounted on a cask, and stood 4½ feet above the ground. It "was placed inside of the octagonal observatory, 10 feet high, supported laterally "by three capstan bars, properly disposed for that purpose. Yet, notwithstanding "these precautions, the whirlwinds at the Island of Deception were so violent, "that the observatory, weighing 508 pounds, was raised perpendicularly from the

* Captain FOSTER says 19 feet for the brass pendulums; and 21½ feet for the iron and copper pendulums: see the note in page 47.

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" ground to the height of the repeating circle, before any lateral direction took " place: when the inside of the foot of the observatory took the upper part of " the repeating circle, and literally dashed it to pieces. Many of its parts were " lost: for, the violence of the snow storm, which accompanied these whirlwinds, " prevented any search being made at the time: and the looseness of the cinders " and ashes, on which the observatory stood, rendered all our after efforts " unsuccessful. The instrument which I now have for the determination of the " latitude, is an altitude and azimuth circle: but, which was so much out of order " when the accident that happened to the repeating circle took place, that I was " obliged to resort to reflecting instruments to supply the deficiency."

All the pendulums were swung at this station: but, previously to noticing them, I would remark that, with respect to the invariable brass pendulum No. 11, instead of meeting with those limited differences in the several results, which mark almost the whole of Captain Foster's experiments, we find anomalies of the most extraordinary kind; and results, differing from each other upwards of $12\frac{1}{2}$ vibrations in a day. To endeavour to account for such singular discordancies as appear throughout the *whole* of the experiments with this pendulum at this place, would be futile and unavailing: more especially as the anomalies are of such a nature, and so enormous, that the whole series must be rejected. It is evident that Captain Foster suspected that something was going wrong, from the great extent to which he carried the series: no less than *sixty two* sets of experiments, occupying 173 hours, and scattered over an interval of 10 days, having been made in regular succession. His suspicion was probably excited, by observing that the intervals of the coincidences were so much greater than they ought to be; and, withal, very irregular: but he has not recorded any remark on these circumstances. In fact, it is very clear that, from the moment the pendulum was set a-going, there was something that deranged its regular motion. None of the results ought to have been so much as 86164 vibrations; yet the smallest result is above that quantity, and the greatest more than 86177: the mean of the whole being full three vibrations in a day more than the correct quantity, as indicated by the other pendulums. No difference in the temperature (which, in fact, was not very variable), nor any difference in the rate of the clock (diffused over 10 days), can possibly account for the discordancy: and these are the most fruitful (if not the *only material*) sources of error. Indeed, if we examine the two specimens in pages 17 and 18, which have been selected for this very purpose, we shall find that although the temperature, the pressure of the atmosphere, the arc of vibration, and the

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rate of the clock, were nearly the same in both cases, yet the several intervals of the coincidences were considerably different. On January 20th, the intervals commenced with $9^m\ 10^s$, and increased to $9^m\ 18^s{\cdot}5$; whereas on January 23rd, they commenced with $9^m\ 20^s{\cdot}5$, and increased to $9^m\ 41^s$. An evident proof that the difference in the result did not arise from errors of observation, but must be attributed to some unknown influence exerted on the pendulum. A comparison of the experiments on other days shows similar discordancies, varying however according to circumstances.

The only probable solution of the mystery, that I can suggest, is, that a *spider* had gained access to the pendulum, and spun one or more lines from the pendulum to the tripod stand, the floor, or some other contiguous body, in such a manner that, by their elasticity (at the end of the arc, when at their greatest stretch) the motion of the pendulum was accelerated. For, I have remarked, in a former part of this Report, page 29, that, in most of the experiments of the kind in question, it appears that after the pendulum at any one station has been placed in the Y's, it has never been removed therefrom (but merely raised and lowered again, by means of the screw, as occasion may require) till it has been ultimately dismounted, and packed up for another station. If, therefore, we suppose that the insect had commenced his operations during the two or three days that the pendulum appears to have been placed in the Y's, before the experiments were begun (on account of their being no astronomical observations for the rate of the clock), it is manifest that the lines would not be disturbed (unless accidentally discovered) till the pendulum was dismounted. For, we may readily imagine a line to be so placed, that it would not be broken by the motion of the pendulum alone. And it is probable (if this be the true cause) that there was more than one line: and that by their accidental and gradual destruction, the discordancies were occasioned; or that the spider was unfortunately so safely lodged within the angles of the apparatus, as to be enabled to extend his depredations from day to day, without suspicion or control. And the darkness of the portable building (no light being admitted except through one opening, for the purpose of illuminating the disc) would favour his concealment. On dismounting the pendulum, the whole discordancy appears to have vanished: since the results, at the subsequent stations, were regular, and accordant with the rest. But, whatever may have been the cause of the anomaly, I have no hesitation in rejecting the results from the present enquiry, as they can only lead to erroneous conclusions.

One objection (and that a very strong one) may be made against the conjecture

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which I have here hazarded: namely, that owing to the severity of the climate at South Shetland, and its desolate state, no insects were likely to be found there. And I ought not to disguise the fact that Mr. Webster, the surgeon of the ship, in his official return to Captain Foster, of the animals found at this place, expressly states that "neither quadrupeds, fish, or *insects* were seen." Nevertheless, this animal might have been brought there from the last station; and as it is the only plausible explanation I can offer, I shall venture to risk it, if it be only to put experimentalists on their guard in similar circumstances. I shall now advert to the experiments.

Twenty three sets of experiments were made with the invariable brass pendulum No. 10; and sixty two sets (as already mentioned) with No. 11. We have also, with the iron pendulum, fifteen sets (consisting of two series) on the knife edge A (the sixth set, however, being rejected, for the reason stated in the note annexed thereto in the Appendix); and sixteen sets on the knife edge B. And, with the copper pendulum, we have nine sets on the knife edge A (the 9th set, however, being rejected, for the reason stated in the note annexed thereto in the Appendix); and ten sets on the knife edge B. The details of these experiments are given in the Appendix: the results are as follow.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
Brass	16	23	h 59.91	86059·88	0·33	0·54
	11	62	173·34	86166·95	10·14	2·55
Iron	A	15	41·34	86264·00	1·00	1·00
	B	16	42·86	86265·61	1·00	0·49
Copper	A	9	25·72	86268·49	0·60	0·45
	B	10	28·49	86268·05	0·76	0·39

These experiments (with the exception of those made with the pendulum No. 11, which I shall reject for the reasons above stated) are in fair accordance with each other, and present no remarkable anomaly.

6. *Cape Horn.*

Captain Foster arrived at this place on March 25th, 1829, and left it on May 24th following. The pendulums were placed in the portable building,

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erected at about 150 feet from the beach, at a place called St. Martin's Cove, at Hermite Island, near Cape Horn. The ground being swampy, stakes were driven down to the depth of 10 or 12 feet, for the apparatus to rest on; and secured in various ways with great labour. This house was defended by a covering, made of thick woollen cloth, called *fearnought*, which was placed at a distance of 2 or 3 feet from the exterior of the wooden building, on all sides except at the window, over which was placed one of the ship's largest sails. So that though the wind was always very powerful whilst they were in this inhospitable and miserable place, and sometimes blew a violent hurricane, yet the interior of the building always presented a perfect calm, and gave not the slightest indication of the confused uproar that was raging without. This information was communicated to me by Captain P. P. KING, R.N., who, during his survey of that coast, visited Captain FOSTER whilst at this place: and it is confirmed by the following note annexed to the experiments made on May 2, 1829, during a violent storm. "Notwithstanding the severity of the gales, the house "containing the pendulums was so well protected by external coverings, and "materials brought from the ship, that the tow, hanging pendent along side the "pendulum, was not affected otherwise than with a circular motion; which I "ascribe to my presence altering the temperature near it, when reading the "thermometer."

The position of the station was in W. Long. $4^h\ 30^m\ 0^s$, and S. Lat. $55°\ 51'\ 20''$: and its height above half tide was $39\frac{1}{2}$ feet. The direction of the line of motion of the pendulums was N. 29° W., and S. 29° E. *by compass:* the deviation of which is about 23° E. St. Martin's Cove is surrounded by a semicircular ridge of abrupt precipitous hills, consisting chiefly of that variety of compact crystalline quartzose rock, denominated greenstone. The lower parts about the bay are composed entirely of this rock, as well as the hills on the northern side; but, on the south, a considerable portion of the mountain mass is of hornblende rock, which had, when brought near the magnetic needle, an evident effect on it. Kater's Peak, situate immediately over the observatory, was found, by the barometer, to be 1740 feet high.

Only the two invariable brass pendulums were swung at this place. Twenty two sets of experiments were made with No. 10; and twenty seven with No. 11: the 13th set, however, being rejected for the reason stated in the note annexed thereto, in the Appendix. The details are given in the Appendix: and the results are as follow.

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Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
Brass	10	22	h 72·97	86033·22	0·64	0·54
	11	27	71·85	86136·84	0·86	0·80

These experiments are in good accordance with each other, and present no remarkable anomaly. It is to be regretted that the iron pendulum was not swung here, in order to have ascertained whether the hornblende rock above mentioned would have affected its motion.

7. *Cape of Good Hope.*

Captain Foster arrived at this place on July 16th, 1829; and left it on December 13th following. The pendulums were swung in one of the apartments at the Royal Observatory there: the floor of which was partly taken up to allow the apparatus to rest on brick pedestals, built up at the desire of Captain Foster. The position of this observatory was assumed by Captain Foster as in E. Long. $1^h\ 13^m\ 55^s$, and S. Lat. 33° 54′ 37″: and its height above the sea as about 33 feet.* The mountain ranges, about Cape Town, are well known and need not here be described. The flats, on which the observatory is built, consist of whinstone, beneath a bed of sand, in most parts 18 or 20 inches in depth. The nearest mountain to the observatory is the Devil's Peak, nearly due West, by compass; distant about $2\frac{1}{2}$ miles, and about 3315 feet high: the Table Mountain is about half a mile more westerly, and about 270 feet higher.

All the pendulums were swung at this station; and the iron and copper ones, under two different circumstances, as I shall presently explain. Twenty five sets of experiments (consisting of two series) were taken with the invariable brass pendulum No. 10; and seventeen sets with No. 11. These experiments occupied Captain Foster's time from August 8th to September 4th: at the close of which period, his health, which for some time past had been on the decline, became so indifferent that he was obliged to retire on board his ship, where he remained for five weeks so unwell as not to be enabled to discharge the most trivial duties. At length, when he had recovered sufficient strength, he

* Captain Foster says $31\frac{1}{2}$ feet for the brass pendulums; and 34 feet for the iron and copper pendulums: see the note in page 47.

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resumed his experiments with the iron and copper pendulums. And, here it may be proper to state that Captain Foster, finding that he had sufficient leisure for the purpose, resolved to make two separate and distinct series of experiments on these two pendulums: viz. one, where the direction of the line of motion was (as in the preceding case of the two brass pendulums) perpendicular to the plane of the magnetic meridian; the other, where the line of motion was coincident with that plane. This variation in the line of motion was adopted for the express purpose of ascertaining whether any difference, arising from such variation in the position alone, would be observable in the results. I shall first notice the former case. With the iron pendulum, we have sixteen sets of experiments on the knife edge A; and sixteen sets also on the knife edge B. With the copper pendulum, we have fifteen sets on the knife edge A; and fifteen sets also on the knife edge B. The details of these experiments are given in the Appendix: and the results are as follow.

Perpendicular to the plane of the Magnetic meridian.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
Brass	10	25	h 70·96	85946·58	1·05	0·86
	11	17	52·78	86050·02	0·12	0·20
Iron	A	16	36·17	86150·99	0·31	0·22
	B	16	36·07	86152·33	0·64	0·41
Copper	A	15	36·86	86156·43	0·47	0·36
	B	15	37·70	86155·87	0·82	0·22

After these experiments were finished, Captain FOSTER changed the position of the whole apparatus, so that the line of motion of the pendulums should be directly perpendicular to what it was before; or, in other words, that the pendulums should now vibrate in the plane of the magnetic meridian. In this position, we have, with the iron pendulum, twelve sets of experiments on the knife edge A; and twelve sets also on the knife edge B. With the copper pendulum, eight sets on the knife edge A; and eight sets also on the knife edge B. The details of these experiments are given in the Appendix: and the results are as follow.

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In the plane of the Magnetic meridian.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
Iron	A	12	27·59 h	86150·48	0·54	0·07
	B	12	29·40	86151·78	0·34	0·30
Copper	A	8	20·48	86155·76	0·38	0·37
	B	8	21·26	86155·26	0·36	0·42

The results of the iron and copper pendulums indicate the following differences, according to the position of the plane of vibration: viz.

Iron . . . { A = 0·51
          { B = 0·55

Copper. . { A = 0·67
          { B = 0·61

Mean = 0·58

Whence it would appear that a pendulum, swung perpendicular to the plane of the magnetic meridian, at this place, makes nearly 0·60 vibration in a day *more* than when swung in the plane of that meridian, and it appears also that the copper pendulum gives a result somewhat greater than the iron pendulum. In fact, the total difference is so small, and so fairly within the errors of observation (see page 34), that were it not for the uniformity and agreement in the results, it might be altogether doubted whether it were really caused (as some persons might suppose) by any electro-magnetic influence.

8. *Island of St. Helena.*

Captain Foster arrived at this place on December 26th, 1829, and left it on February 9th following. The apparatus was erected in Lemon Valley, in a room previously occupied by the serjeant in charge of the fort: the flooring was removed; and, the ship's bucklers being bedded in the bare ground, the triangular stands were placed thereon. The position of the station was in W. Long. $0^h\ 22^m\ 45^s$, and S. Lat. 15° 56′ 7″. Its height above the level of the sea was 31 feet:* and the direction of the line of motion of the pendulum was

* Captain Foster says 30½ feet for the brass pendulums; and 32 feet for the iron and copper pendulums: see the note in page 47.

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N. 45° W., and S. 45° E. *by compass.* The mountains directly at the back of the pendulum station were about 2000 or 3000 feet high.

Both the invariable brass pendulums, and also the copper convertible one, were swung here: but not the iron one. Twenty one sets of experiments were made with No. 10; and twenty four with No. 11. With the copper pendulum, we have nine sets on the knife edge A; and twelve sets on the knife edge B. The details are given in the Appendix: and the results are as follow.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
Brass	10	21	h 59·13	85903·24	0·48	0·79
	11	24	72·18	86006·46	0·30	0·33
Copper. . . .	A	9	27·18	86113·89	0·43	0·36
	B	12	36·24	86112·69	0·65	0·46

These experiments are in very good accordance with each other; and present no remarkable anomaly. It was Captain FOSTER's intention (had he found sufficient leisure) to have swung the pendulums also at some elevated station in this island: in order to have ascertained (if possible) the effect of such elevation on the pendulum.

9. *Island of Ascension.*

Captain FOSTER arrived here on February 14th, 1830, and left it on June 6th following. The apparatus was erected at a house in Barrack Square: the ship's bucklers were bedded in the bare ground, as at St. Helena; and the triangular stands placed thereon. The position of the station was in W. Long. $0^h\ 57^m\ 26^s$, and S. Lat. 7° 55′ 23″. Its height above low water neap tides was about $14\frac{1}{2}$ feet:* and as the rise of the tide is only about 3 feet, I have assumed 16 feet as the height of the station above the mean level of the sea. The direction of the line of motion of the pendulums was N. 56° W., and S. 56° E. *by compass.* This island, which may be comprised nearly within a circle of about 6 or 7 miles diameter, presents in every part undoubted marks of the eruptive violence of volcanic action, in the apparent remains of extinct craters

* Captain FOSTER says $13\frac{1}{4}$ feet for the brass pendulums; and $15\frac{3}{4}$ feet for the iron and copper pendulums: see the note in page 47.

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and various beds of ashes and cinders. The surface of the country is extremely rugged, from the numerous ridges of rocky lava and the scattered masses of scoria. Beds of volcanic loadstone were met with in the immediate vicinity of the station: and a piece of the rock of the island, close to the portable observatory, was sufficiently powerful to deflect the magnetic needle 5° from the meridian. This effect was further evinced by the anomalous variations of the compass in different parts of the island. The hills, which lay directly at the back of the pendulum room, were of considerable elevation; and Cross Hill, not far distant, was 870 feet high.

All the pendulums were swung at this station. Nineteen sets of experiments were made with the invariable brass pendulum No. 10; and twenty six sets with No. 11. With the iron pendulum, we have ten sets on the knife edge A; and nine sets on the knife edge B. And with the copper pendulum, we have fourteen sets (consisting of two series) on the knife edge A; and thirteen sets on the knife edge B. The details of these experiments are given in the Appendix: and the following are the results.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
			h			
Brass	10	19	54·31	85887·44	0·47	0·34
	11	26	76·66	85990·71	1·09	0·52
Iron	A	10	26·04	86092·30	0·74	0·78
	B	9	23·83	86092·87	0·62	0·56
Copper	A	14	36.67	86097·68	0·73	0·55
	B	13	35·57	86097·07	0·64	1·00

By a reference to the Appendix it will be seen that the results of experiments 21, 22, 23 of the brass pendulum No. 11, are very discordant with the rest: and more especially with experiment 24, which is a continuation of the same day's work. This fact did not escape the observation of Captain Foster; who judged, from the increase in the number of vibrations, that there was something wrong. See his note (*b*) on this subject, appended to the experiments in question. I am unable to account for the discordance, unless we suppose that, in letting down the knife edge on the agate planes, on the morning of March 4th, a slight displacement of the knife edge took place: and I have already shown (page 34) that the knife edge of this pendulum was susceptible of

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sensible differences from this cause. I have therefore not rejected these anomalous experiments: and, in fact, if they were rejected, the general mean would have been diminished only 0·13 vibration.

After the above experiments were completed, Captain FOSTER was desirous of ascertaining the effect (if any) of the local attraction of Green Mountain, one of the most elevated points in the island. For this purpose he took the invariable brass pendulum No. 10 to the top of that mountain, whose height was determined to be 2230 feet; whose position, with respect to the first station, was S. 61° E. *true;* and whose distance therefrom was 22700 feet. The Green Mountain (so called from the constant verdure on its top) has beds of pummice, black scoriæ and ashes, superimposed on a basis of trachyte: but, it would be difficult to give a geological description of the volcanic productions which nature has so widely scattered over this island. The astronomical observations, for ascertaining the time, were made, as usual, with the transit instrument; all the requisite apparatus having been conveyed to the station on the mountain. The direction of the line of motion of the pendulum was N. 40° E., and S. 40° W. *by compass:* which is nearly perpendicular to the line of motion at the Barracks. Twenty sets of experiments were made with this pendulum; the details of which are given in the Appendix: the results are as follow.

Pendulum.	Sets.	Total Interval.	Vibrations, uncorrected for Elevation.	Greatest diff. from mean.	
				+	—
Brass 10	20	h 53·53	85878·96	0.48	0·85

It would have been more satisfactory if Captain FOSTER had taken with him also one or more of the other pendulums, for the purpose of confirming these results; as this is the first experiment of the kind that has ever been tried, with an invariable pendulum. With respect to the correction for the height above the mean level of the sea (2230 feet), I have not applied it to the above result, as some difference of opinion may be entertained as to the value of the factor x, which ought to be used. See page 28. The full correction is 9·16 vibrations: and if we take $\frac{2}{3}$ of this value, as at all the other stations, we shall have the required correction equal to 6·11 vibrations; which, being added to the result above given, will make the true number of vibrations, at the Green Moun-

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tain, equal to 85885·07 vibrations: which is 2·37 vibrations less than the number made by the same pendulum on the sea coast. Indeed, if the *whole* correction were applied, it would not much exceed the result at the sea side. This subject is worthy of further attention in any subsequent experiments.

10. *Fernando de Noronha.*

Captain Foster arrived at this place on June 12th, 1830, and left it on July 18th following. The apparatus was erected at the Governor's house; the floor of which was taken up, and iron pigs of ballast were bedded in the bare ground, on which the triangular stands were placed. The position of the station was in W. Long. $2^h\ 9^m\ 23^s$, and S. Lat. $3°\ 50'\ 0''$. Its height above the mean level of the sea has not been noted by Captain Foster; but, from the best information I can obtain, it was about 35 feet. The direction of the line of motion of the pendulums is also omitted in Captain Foster's observation books: but, from a rough sketch found amongst his papers, I apprehend it was about N.E. and S.W. The island of Fernando de Noronha, geologically considered, belongs to the trap family, from the predominance of greenstone, basalt, and hornblende. The former is widely diffused, and alternates with the two others: these, with porphyritic felspar, may be regarded as the constituent rocks. The basaltic formation displays in many parts a remarkable conformity to that structure and disposition from which they originally derived the name: mounting directly from the beach, up hills and cliffs, in a series of steps or stairs, so perfect as often to seem the work of art. Many of the loose and scattered rocks upon the surface present such strong marks of an igneous origin, that it would be difficult, if not impossible, to discriminate between some of the specimens of this island, and the well-burnt products of Ascension and other volcanic islands. The soil of the island is a rich deep loam.

Only the two invariable brass pendulums were swung at this place: the two convertible pendulums not even being landed, on account of Captain Foster's wish to devote more time to the determination of the longitude of the place. But, it may be proper to state that, prior to the commencement of the experiments, the pendulum of the clock (with which the coincidences were taken) was cleaned of the rust which it had acquired during the time that Captain Foster was at Ascension Island. Twenty one sets of experiments were made with the pendulum No. 10; and eighteen sets with No. 11. The detail is given in the Appendix: the results are as follow.

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Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
Brass	10	21	h 52·41	85887·26	0·32	0·58
	11	18	46·27	85990·33	0·62	0·41

These experiments are in good accordance with each other; and present no remarkable anomaly.

11. *Maranham.*

Captain FOSTER arrived at this island on July 23rd, 1830, and left it on September 5th following. The apparatus was erected at the house of Mr. HESKETH, the British Consul at the town of Maranham, in an apartment adjoining that in which Captain SABINE had swung his pendulums, in the year 1822: the floor being paved with flag stones, the triangular stands were placed thereon. Neither the position of the station, nor its height above the mean level of the sea, is noted by Captain FOSTER; I shall therefore assume Captain SABINE'S determination of these two elements in the computation: namely, the position in W. Long. $2^h\ 56^m\ 57^s$, and S. Lat. 2° 31′ 35″;* and its height above the sea 77 feet. The direction of the line of motion of the pendulums was N. 20° W., and S. 20° E.: but, whether true, or by compass, is not stated by Captain FOSTER; neither is it of much importance, as the variation there was only 0° 31′ W. Captain FOSTER determined the rates of his clocks here, as at other places, by means of the transit instrument: and although Captain SABINE states that "the house being in the middle of the city, "and without grounds, had no situation in which a transit instrument might "have been placed," yet Captain FOSTER succeeded in finding a convenient position on the flags of the upper balcony of the house, which commanded a view of the heavens from 80 to 6 degrees. A meridian mark was placed on the roof of a neighbouring house; the inhabitants of which were kind enough to allow his people to enter, at the times required, to light it up. The country, in and about the vicinage of Maranham, consists chiefly of beds of clay, and a dark iron sandstone, imbedding grains of white quartz, and sometimes larger

* Corrected for the error of the level. In Captain SABINE'S *Account, &c.* page 71, the latitude is stated to be 2° 12′: but this, I presume, is erroneous, and that the true latitude is to be deduced from the observations in page 300, &c.

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fragments. It is the only building stone in the neighbourhood: but it is not found in very extensive masses. The clay beds are of considerable depth in some parts.

The two invariable brass pendulums, and also the copper one, were swung at this place: but not the iron one, on account of the time it would have taken; and which might have prevented Captain Foster from sailing to Para with a full moon. Nineteen sets of experiments were made with the brass pendulum No. 10; and sixteen sets with No. 11. With respect to the copper pendulum, we have sixteen sets on the knife edge A; and twelve sets on the knife edge B. Captain Foster had at first taken only twelve sets on the knife edge A; but, after the whole were completed, he imagined that he had remarked some discordancies in those experiments, and therefore made four more additional sets with that knife edge, as mentioned in the note thereto in the Appendix. The two series agree remarkably well with each other. The details of these experiments are given in the Appendix: the results are as follow.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean	
					+	−
Brass	10	19	h 48·75	85873·81	0·31	0·27
	11	16	41·73	85976·97	0·44	0·47
Copper	A	16	41·94	86084·62	0·69	0·49
	B	12	32·05	86083·06	0·22	0·45

These experiments are in good accordance with each other; and present no remarkable anomaly.

12. *Para.*

Captain Foster arrived at this place September 9th, 1830, and left it on October 11th following. The apparatus was erected in a house, hired for the occasion; being No. 17 in the Travessa do Paçinhõ, which bore E.N.E. from the cathedral, and distant therefrom 1800 feet. The rooms were sufficiently commodious to enable two pendulums to be swinging at the same time: and Captain Foster, taking advantage of this favourable circumstance, made experiments with the iron and copper convertible pendulums, whilst he was also experimenting on the invariable brass pendulums. The position of the station is not given by Captain Foster: but, from the chart deposited at the Admi-

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ralty, it appears to have been in W. Long. $3^h\ 13^m\ 43^s$, and S. Lat. 1° 27′ 0″. Its height above the mean level of the sea was 40½ feet. The direction of the line of motion of the pendulums is not stated: but, from a diagram found amongst Captain FOSTER's papers, it appears to have been N. 77° W., and S. 77° E. *true*. The soil upon which the city of Para is built, is a varying mixture of clay and sand: the beds of clay are extensive, and frequently 30 or 40 feet deep. There is little or no rock to be met with, except at particular parts, and in isolated masses; that which is used in the city being procured from the country, at a few miles distance. This being an equatorial station, Captain FOSTER took several observations of equal altitudes of the sun, for obtaining the correct time; but the computations are left in an incomplete state: and this is of less importance, as a sufficient number of observations of stars were taken with the transit instrument for that purpose.

Eighteen sets of experiments were taken with the invariable brass pendulum No. 10; and twenty two sets with No. 11. With the iron pendulum, we have twelve sets with the knife edge A; and thirteen sets with the knife edge B: but I apprehend that these latter ones are subject to a correction, to which I shall presently allude. With the copper pendulum, we have fourteen sets on the knife edge A; and also fourteen sets on the knife edge B: the 8th set however being rejected for the reason stated in the note annexed thereto in the Appendix. The details are given in the Appendix: the following are the results.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
Brass	10	18	h 45·53	85875·76	0·25	0·40
	11	22	57·17	85979·09	0·37	0·29
Iron	A	12	30·70	86080·07	0·96	0·88
	B	13	33·24	86084·32*	0·62	0·53
Copper	A	14	36·78	86086·19	0·39	0·64
	B	14	36·07	86085·01	0·47	0·67

These experiments do not, at first sight, present any remarkable anomaly: but, if we examine more closely the results of the experiments with the iron pendulum, we shall find a greater difference between the results of the two knife edges A and B than ought to exist. The mean difference, in the number of

* From this value we should deduct 2·04 vibrations, as stated in the sequel.

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vibrations between these two knife edges, is about $1\frac{1}{2}$ vibration in a day. It has sometimes amounted to 2 vibrations, and at other times has been nearly as low as $\frac{1}{2}$ a vibration: the difference being probably occasioned by the accidental difference of position of the knife edge on the agate planes, as already noticed in the preceding part of this Report. See page 34. But, here the difference amounts to the enormous quantity of 4·25 vibrations in a day: and there is only one way in which I can account for this anomaly. I have shown, in page 32 of this Report, and also more at large in my Paper in the *Phil. Trans.* for 1832, page 467, that there is a difference, of 2·04 vibrations in a day, in the results with the knife edge B of this pendulum, according as one face or the other is turned towards the observer: the results being the *least*, when the side marked with the great Roman letter B is in front. As Captain Foster was requested always to keep the large letters in front, or to note the circumstance if otherwise (merely for the sake of uniformity in his experiments, and not from any idea that the results would be affected, which at that time was not known, nor even suspected), it is presumed, from his well known habits of accuracy and regularity, that he always did, or intended to do, so. But, as I have already remarked in the experiments at Greenwich (see page 45) it is possible that the circumstance may inadvertently have escaped him; and thus the anomaly has occurred. As an excuse for such a mistake, I would observe that the engraving of the letters is not very legible, especially in a darkened room, like the one he used. I am unable to account for the discordance in any other manner: and if we deduct 2·04 vibrations from the result stated in the above table, we shall have the difference between the two knife edges only 2·21 vibrations; which, although still large, will accord tolerably well with the mean of the other results. The number of vibrations due to the knife edge B will, if thus corrected, be only 86082·28; and this is the value which I shall assume in deducing the figure of the earth.

13. *Trinidad.*

Captain Foster arrived at Port Spain, in this island, on October 28th, 1830; and left it on December 7th following. The apparatus was erected in the Vestry of the Protestant Church (the same spot as that chosen by Captain Sabine in his experiments in the year 1822): and the floor being formed of cement, or some other species of composition, the triangular stands were placed thereon. Neither the position of the station nor its height above the mean level of the sea is stated by Captain Foster; I shall therefore assume these elements as given

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by Captain Sabine, namely the position in W. Long. $4^h\ 6^m\ 20^s$, and N. Lat. 10° 38′ 55″: * and its height above the sea 21 feet. The direction of the line of motion of the pendulums is also omitted in the observation book; but, from diagrams found amongst Captain Foster's papers, it appears that the direction of the brass pendulums was N. 25° E., and S. 25° W.: and that of the iron and copper pendulums, N. 32½° W., and S. 32½° E.; but whether true, or by compass, I cannot now ascertain. The soil, upon which the town of Port Spain is built, consists first of a bed of clay, secondly of a fine red sand, and thirdly of gravel. These beds are pretty regular as to their order of sequence; but vary in their respective depths: the whole series being from 20 to 30 feet. The suburbs abound with limestone quarries, which are worked to a considerable extent. This limestone is of a compact crystalline nature, of a dark colour, and intersected with numerous veins of white marble. The chain of hills, which run through the island on the northern side, are of schistose quartz, quartz rock, and micaceous schist.

All the pendulums were swung at this place: and, there being convenience for swinging two pendulums at the same time, Captain Foster made experiments on the iron and copper convertible pendulums, whilst he was experimenting on the invariable brass pendulums. Twenty sets of experiments were made with the brass pendulum No. 10; and seventeen sets with No. 11. With the iron pendulum, we have nine sets on the knife edge A; and also nine sets on the knife edge B. With the copper pendulum, we have twelve sets on the knife edge A; and also twelve sets on the knife edge B. The details of all these are given in the Appendix: the following are the results.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
			h			
Brass	10	20	50·21	85882·54	0·51	0·51
	11	17	43·13	85986·65	0·76	0·86
Iron	A	9	22·89	86086·55	0·23	0·42
	B	9	23·30	86088·40	0·39	0·41
Copper	A	12	31·05	86092·59	0·40	0·66
	B	12	29·90	86091·20	0·45	0·58

All these experiments appear in good accordance; and do not present any remarkable anomaly.

* Corrected for the error of the level.

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14. *Porto Bello.*

Captain Foster arrived at this place on December 22nd, 1830, never to return to his own country! The ship departed, without its lamented commander, on February 8, 1831. The apparatus, for making these final experiments, was erected in a house opposite the Catholic Chapel. The ship's bucklers were imbedded in the bare ground; and the triangular stands placed thereon. The position of the station was in W. Long. $5^h\ 18^m\ 18^s$, and N. Lat. $9°\ 32'\ 30''$. Its height above the level of the sea is not stated in the observation book; but, from the best information I have been able to obtain, it was about 12 feet. The direction of the line of motion of the pendulums is also omitted in the observation book; but, from a diagram found amongst Captain Foster's papers, it appears to have been N. 56° W., and S. 56° E.: but, it does not state whether true, or by compass. The soil is a bed of stiff ferruginous clay: the hills appeared to be chiefly of the trap porphyries, intermingled with some basalt and jasper and agate rocks. Those, which were close to the pendulum station, were from 300 to 500 feet high: but, in the neighbourhood, at about 3 or 4 miles, they were 1500 feet in height.

Only the two invariable brass pendulums were swung at this place: twenty one sets of experiments were made with No. 10; and fifteen sets with No. 11. The details are given in the Appendix: the following are the results.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+	−
Brass	10	21	h 47·15	85887·39	0·22	0·21
	11	15	35·73	85991·86	0·60	0·79

These results are in good accordance, and do not present any remarkable anomaly.

15. *London (after the voyage).*

Immediately after the occurrence of the unfortunate accident, which deprived the world of the valuable services of Captain Foster, the *Chanticleer* returned to England, under the command of the First Lieutenant (now Captain) Austin; and arrived at Torbay on April 21, 1831. The instruments and apparatus were not landed, however, till the arrival of the ship in the river Thames: soon after which, the pendulums were delivered over to me, by command of the Lords

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Commissioners of the Admiralty, for the purpose of making the requisite experiments for determining whether any accident had occurred to them during the voyage, sufficient to influence their respective rates. I first examined, very minutely, every portion of each pendulum: but could not discover any appearance of injury in either of them, except that a slight indication of rust was observable, on different parts of the knife edges of all the pendulums, occasionally touching the sharp edge on which the vibrations are made: but not sufficient, nor so posited, as (in my opinion) to cause any difference in the results. In every other respect, the pendulums appeared to be in the same state as when they were sent off: the iron pendulum was free from rust; and the copper and brass pendulums perfectly clean. But, the more obscure and inexplicable traces of discordance, or anomaly, could only be discovered by the rigorous test of experiment: and my first object was to make a short series of experiments on each pendulum, as early as possible, for the purpose of ascertaining this point.

These experiments were made at my own house, in the manner already described in the former part of this Report (page 42): the vacuum apparatus having been removed for the purpose of swinging the pendulums in free air. I commenced with the invariable brass pendulum No. 10: four sets of experiments only were at first taken; but, finding that these differed materially from the result deduced from Captain FOSTER'S experiments made at Mr. BROWNE'S house, before the voyage, I repeated the experiments a few days after, and took three more sets, and with nearly the same results. I then placed the pendulum on the agate planes of No. 11, in order to see whether I could trace the cause of the anomaly to any source of this kind: and took four sets of experiments (occupying 13·51 hours) in this manner; but the results were identical with the first four sets above mentioned, there being a difference of only 0·01 vibration between the two series. The pendulum then remained in its case till the month of January following, when I took four more sets; the results of which accord very well with the preceding ones. As the knife edge of this pendulum appears, from what has been already stated in page 34, to be very perfect, the conclusion is that the pendulum has changed its rate since Captain FOSTER'S first experiments with it; as it now makes 1·59 vibration more than it did at that time (see page 37). I cannot discover, at any station during the voyage, any trace of this alteration: the fact, however, is certain; as I have frequently verified the above results by subsequent experiments. It is not necessary however to give the detail of any more than those above enumerated.

With respect to the brass pendulum No. 11, I at first made with it four sets of experiments also, which accorded very well with those made by Captain

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Foster before the voyage: and, in order to confirm these results, I repeated the experiments a few days after, with very little difference in the results. I then, as a matter of curiosity, placed the pendulum on the agate planes of No. 10; and from the mean of two sets of experiments (occupying 9·20 hours) found the difference in the result to be less than half a vibration. I considered therefore that this pendulum had not varied from its mean rate, from the time it first reached Captain Foster, to the date of the experiments here alluded to. I have had occasion, however, to notice in the preceding part of this Report (page 38) a very remarkable alteration that has *since* taken place in the results with this pendulum. These results are given in Table VI., in the Appendix: whereby it appears that it now makes 4·81 vibrations in a day, more than it did when it first returned from the voyage. I am unable to throw any light on the cause of this anomaly.

With the iron and copper convertible pendulums I, at first, made two sets of experiments on each knife edge of each pendulum, in free air. Then, having replaced the vacuum apparatus, which had been removed for the purposes above mentioned, I commenced the experiments for determining the proper correction for the reduction to a vacuum, as already alluded to in page 25. The details of all these experiments are given in the Appendix: and the following are the results. But, I would previously remark that, with respect to the iron pendulum, the experiments on the knife edge B were made with the small Roman letter b facing the observer. This circumstance was not, at the time, considered of any importance: but I have since ascertained (as already noticed in page 32 of this Report, and also more at large in my Paper in the *Phil. Trans.* for 1832, page 467) that there is a difference of 2·04 vibrations in the results with this knife edge, according to which side is turned towards the observer. This value therefore I have deducted from the results obtained by experiment.

Pendulums.		Sets.	Total Interval.	Vibrations.	Greatest diff. from mean.	
					+ .	—
Brass	10	11	h 43·15	86016·42	0·37	0·50
	11	7	40·27	86118·49	0·73	0·66
Iron	A	10	77·36	86219·29	0·34	0·27
	B	11	90·60	86221·27	0·74	0·44
Copper	A	14	115·60	86224·55	0·35	0·54
	B	15	107·01	86223·11	0·41	0·22

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General view of the preceding results.

I shall now present a general view and comparison of all the preceding results, arranged in one table, according to the order in which the stations were successively visited.*

No.	Station.	Latitude.	Brass.		Iron.		Copper.	
			No. 10.	No. 11.	A.	B.	A.	B.
1	London (F) . .	51° 31′ 8″ N.	86014·83	86118·65				
2	Greenwich . . .	51 28 40 —	86014·49	86117·57				
3	Monte Video . .	34 54 26 S.	85950·27	86053·21				
4	Staten Island . .	54 46 23 —	86029·89	86134·38	86235·07	86235·64	86240·86	86237·67
5	South Shetland .	62 56 11 —	86059·88	rejected	86264·00	86265·61	86268·49	86268·05
6	Cape Horn . .	55 51 20 —	86033·22	86136·84				
7	Cape of G. Hope	33 54 37 —	85946·58	86050·02	86150·77	86152·27	86156·20	86155·65
8	St. Helena . . .	15 56 7 —	85903·24	86006·46	. .	. .	86113·89	86112·69
9	Ascension . . .	7 55 23 —	85887·44	85990·71	86092·30	86092·87	86097·68	86097·07
10	Fernando de Nor.	3 49 59 —	85887·26	85990·33				
11	Maranham . . .	2 31 35 —	85873·81	85976·97	. .	. .	86084·62	86083·06
12	Para	1 27 0 —	85875·76	85979·09	86080·07	86082·28†	86086·19	86085·01
13	Trinidad. . . .	10 38 55 N.	85882·54	85986·65	86086·55	86088·40	86092·59	86091·20
14	Porto Bello . .	9 32 30 —	85887·39	85991·86				
15	London (B) . .	51 31 26 —	86016·42	86118·49	86219·29	86221·27	86224·55	86223·11

In this table I have not included the result obtained by the brass pendulum No. 10, at the Green Mountain, in the Island of Ascension; as, from the nature of those experiments they should be separately considered. Neither have I included the experiments made at London with the iron and copper convertible pendulums, *prior* to the voyage; for the reasons already stated in page 43. Those made at South Shetland, with the brass pendulum No. 11, are wholly rejected, for the reasons stated in page 51.

* The first station, marked "London (F)," denotes the place where Captain FOSTER made his experiments in London *before* the voyage: and the last station, marked "London (B)," denotes the position of my house, where I made the experiments *after* the voyage.

† The observed number of vibrations was 86084·32; but I have deducted 2·04 vibrations, for the reasons stated in page 64.

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In order to show the degree of accordance between the results of the different pendulums at each station, I shall here give another table which will exhibit this in a more satisfactory manner than can be done by any description. It is well known that two pendulums, adjusted nearly to the same rate, ought to preserve the same difference* in the number of vibrations, made by each of them in a mean solar day, in whatever part of the world they may be placed: and they would, doubtless, do this within very minute limitations, could we depend on the knife edges being always placed on the agate planes, precisely in the same manner in each experiment. This circumstance however has not yet been sufficiently attended to: and although in future experiments it may (and must) be provided for, yet we must deal with the present and past experiments, in the best manner we can.

If we examine the results of the experiments with the invariable brass pendulums No. 10 and No. 11, at the different stations, we shall find that the mean difference between the number of vibrations made by each of them is 103·44 vibrations. In like manner if we examine the results with the two knife edges A and B of the iron pendulum, at the different stations, we shall find the mean difference between them is 1·48 vibration: and with the two knife edges A and B of the copper pendulum, the mean difference is 1·28 vibration. If therefore we discover that, at any one of the stations, these differences vary much from the mean, we may suspect some error in the experiments: and it was in this manner that I detected the anomalies at South Shetland and at Para; as already mentioned in pages 50 and 64. The following table will exhibit the observed differences, in the number of vibrations, between the two brass pendulums, and between the two knife edges of each of the iron and copper pendulums; at each of the stations, in the order in which they were visited.†

* Strictly, the same *ratio:* but where the difference is small, as in the present case, we may assume the actual difference observed, for the purpose of the comparison.

† A more rigid examination might be made, by taking the differences between each of the brass pendulums, and each of the knife edges of the iron and copper pendulums: but, the present view of the subject will be sufficient for the purpose required.

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No.	Stations.	Brass.	Iron.	Copper.
1	London (F)	103·82		
2	Greenwich	103·08		
3	Monte Video	102·94		
4	Staten Island.	104·49	0·57	3·19
5	South Shetland	rejected	1·61	0·44
6	Cape Horn	103·62		
7	Cape of Good Hope . .	103·44	1·50	0·55
8	St. Helena	103·22		1·20
9	Ascension	103·27	0·58	0·62
10	Fernando de Noronha .	103·07		
11	Maranham.	103·16		1·56
12	Para	103·33	2·21*	1·18
13	Trinidad.	104·11	1·85	1·39
14	Porto Bello	104·47		
15	London (B)	102·07	1·98	1·44
	Mean =	103·44	1·48	1·28

From this table it appears that the difference between the two brass pendulums was never so small during the whole course of the voyage, as it was on the return of the pendulums to London: and the inference is that the discordance observed at London in No. 10, between the results before and after the voyage, as already noticed in pages 37 and 67, has arisen from circumstances which have occurred *since* the termination of the voyage. As this, however, is a gratuitous assumption, and as other circumstances might have affected the relative results of these two pendulums, I have not thought it right to reject the results obtained with the pendulum No. 10, since its return to this country. Indeed we find differences, at other stations, of a contrary nature, amounting to upwards of one vibration: but these may be partly owing to the variation of the position of the knife edge on the agate planes, at the different stations. With respect to the iron and copper pendulums, we have differences, of an equal amount, which may probably be attributed to the same cause: except, perhaps, the case of the copper pendulum at Staten Island, where the discordance is greater than any one of those mentioned in the table (see page 48). On the whole,

* This is the difference, after the correction of the presumed error alluded to in page 64.

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however, although we cannot now throw any further light on these partial anomalies, yet, after all, the total results are as accordant as might be fairly expected; and will enable us, as far as the experiments are concerned, satisfactorily to proceed to the elucidation of the subject for which those experiments were undertaken: namely the determination of the *Figure of the Earth.*

Figure of the Earth deduced from these Experiments.

Let v denote the number of vibrations* made by an invariable pendulum at the equator, in a mean solar day, and g the increase in the force of gravity from the equator to the poles; also let L denote the latitude of any other place on the globe, and V the number of vibrations made by the same pendulum there, in the same time. Then, supposing the earth to be an ellipsoid of revolution, we have

$$V^2 = v^2 (1 + g \sin^2 L)$$

an equation containing the two unknown quantities v and g: the solution of which may in the present case be considered as accomplished when we are able to substitute, for those quantities, such values as shall make the sum of the squares of the errors a minimum. These values are obtained, in the usual manner, by forming the several results at each station into equations of condition, the numerical values of V^2 and $\sin^2 L$ being introduced; the first as given by the observations, and the other by the trigonometrical tables. The following example, of the mode of deducing the results from the invariable brass pendulum No. 10, will explain the whole process pursued on such occasions.† Let $E^{(1)}$, $E^{(2)}$, $E^{(3)}$, &c. denote the respective errors, or differences between the observed and calculated values, at each station, arranged (for the sake of convenience) according to their order of latitude; and make y equal to $g v^2$: we then have the following equations of condition: viz.

* It has hitherto been usual, in investigations of this kind, to assume the *length* of the seconds pendulum, instead of the *number of vibrations* made thereby, as one of the elements in the computation. But, as the *number of vibrations* is the quantity actually observed, and is indeed the strict object of our research, and as the absolute *length* of the seconds pendulum is not necessarily involved in the enquiry, and must, when employed for the purpose of comparison with the results of other pendulums, be clogged with all the anomalies arising from the various corrections employed in the reductions, I have considered that the results will be rendered more simple, and that they can be more satisfactorily and readily compared, by confining the investigation to the *number of vibrations.*

† See M. Mathieu's paper *Sur les expériences du pendule,* inserted in the *Con. des Tems* for 1816, page 319, &c., where this method is fully illustrated.

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Para . . . . . 7374646169 $-v^2-\cdot0006403\times y=E^{(1)}$
Maranham . . . . . 7374311201 $-v^2-\cdot0019426\times y=E^{(2)}$
Fernando de Noronha . . 7376621095 $-v^2-\cdot0044689\times y=E^{(3)}$
Ascension . . . . . 7376652345 $-v^2-\cdot0190007\times y=E^{(4)}$
Porto Bello . . . . . 7376643773 $-v^2-\cdot0274780\times y=E^{(5)}$
Trinidad . . . . . 7375810676 $-v^2-\cdot0341456\times y=E^{(6)}$
St. Helena . . . . . 7379366599 $-v^2-\cdot0753784\times y=E^{(7)}$
Cape of Good Hope . . . 7386814620 $-v^2-\cdot3112457\times y=E^{(8)}$
Monte Video . . . . . 7387448945 $-v^2-\cdot3274692\times y=E^{(9)}$
Greenwich . . . . . 7398492492 $-v^2-\cdot6120975\times y=E^{(10)}$
London (F) . . . . . 7398550971 $-v^2-\cdot6127966\times y=E^{(11)}$
London (B) . . . . . 7398824509 $-v^2-\cdot6128818\times y=E^{(12)}$
Staten Island . . . . . 7401141973 $-v^2-\cdot6672827\times y=E^{(13)}$
Cape Horn . . . . . 7401714943 $-v^2-\cdot6849635\times y=E^{(14)}$
South Shetland . . . . . 7406303242 $-v^2-\cdot7929936\times y=E^{(15)}$

In order to find such values of v^2 and y respectively, that the sum of the squares of the errors $E^{(1)}$, $E^{(2)}$, $E^{(3)}$, &c. may be the least possible, we must form the equations of minimum with respect to v^2 and y. As the coefficient of v^2 is unity, in all the preceding equations, the condition of minimum with respect to this unknown quantity, will be obtained by making the sum, divided by the number of equations (= 15), equal to zero: or

$$7387556237 - v^2 - \cdot3189857 \times y = 0$$

This equation of minimum however can only take place, when the sum of the errors is nothing. Then, if we multiply each of the above equations of condition, by the coefficient of y in such equation, we have the following results: viz.

Para . . . . . $-4722143+\cdot0006551\times v^2+\cdot0000004\times y$
Maranham . . . . . $-14325162+\cdot0019426\times v^2+\cdot0000038\times y$
Fernando de Noronha $-32965107+\cdot0044689\times v^2+\cdot0000200\times y$
Ascension . . . . . $-140161727+\cdot0190007\times v^2+\cdot0003610\times y$
Porto Bello . . . . . $-202695211+\cdot0274778\times v^2+\cdot0007550\times y$
Trinidad . . . . . $-251851339+\cdot0341456\times v^2+\cdot0011659\times y$
St. Helena . . . . . $-556245063+\cdot0753784\times v^2+\cdot0056819\times y$
Cape of Good Hope . $-2299114301+\cdot3112457\times v^2+\cdot0968739\times y$
Monte Video . . . . $-2419162027+\cdot3274692\times v^2+\cdot1072360\times y$
Greenwich . . . . . $-4528599371+\cdot6120975\times v^2+\cdot3746634\times y$
London (F) . . . . $-4533807817+\cdot6127966\times v^2+\cdot3755200\times y$
London (B) . . . . $-4534604445+\cdot6128818\times v^2+\cdot3756241\times y$
Staten Island . . . . $-4938653920+\cdot6672827\times v^2+\cdot4452662\times y$
Cape Horn . . . . . $-5069904323+\cdot6849635\times v^2+\cdot4691750\times y$
South Shetland . . . $-5873151850+\cdot7929936\times v^2+\cdot6288390\times y$

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The sum of all which quantities, being made equal to zero, and divided by 15, will give

$$-2359997587 + \cdot3189857 \times v^2 + \cdot1920790 \times y = 0$$

for the condition of minimum with respect to y. And if we eliminate v^2 by means of this equation and the preceding one, we have

$$y = \frac{10886981}{\cdot2831679} = 38447088$$

and consequently

$$v^2 = 7375292166$$

Now, if we make f equal to the ratio of the centrifugal force at the equator, to the force of gravity there, we shall have, according to Clairault's theorem, the compression of the earth $\left(\frac{1}{c}\right)$ equal to

$$\frac{1}{c} = \frac{5f}{2} - g$$

And if f be assumed equal to $\frac{1}{289}$, we have

$$\frac{1}{c} = \cdot00865052 - g$$

Therefore, since $\frac{y}{v^2} = g = \cdot00521296$, we have

$$\frac{1}{c} = \cdot00343756 = \frac{1}{290\cdot90}*$$

The general expression therefore for the number of vibrations made by this pendulum, at any station whose latitude is L, according to Captain Foster's experiments, will be

$$V = \left(7375292166 + 38447088 \sin^2 L\right)^{\frac{1}{2}}$$

The following table will show how far this equation will satisfy the observations: in which are given the observed number of vibrations made by the pendulum at each place; and in a collateral column, the value computed agreeably to the above formula: the last column contains the difference between the two preceding columns.

* If the results of the experiments, made with this pendulum, *since* the voyage, were rejected (see page 71), we should have $\frac{1}{c} = \frac{1}{291\cdot03}$. So that no material difference in this quantity is caused by preserving or rejecting them.

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Stations.	Latitude.	Vibrations		Difference.
		observed.	computed.	
Para	1° 27′ 0″ S.	85875·76	85879·65	−3·89
Maranham	2 31 35 —	85873·81	85879·90	−6·09
Fernando de Noronha .	3 49 59 —	85887·26	85880·50	+6·76
Ascension	7 55 23 —	85887·44	85883·76	+3·68
Porto Bello	9 32 30 N.	85887·39	85885·66	+1·73
Trinidad	10 38 55 —	85882·54	85887·16	−4·62
St. Helena	15 56 7 S.	85903·24	85896·40	+6·84
Cape of Good Hope . .	33 54 37 —	85946·58	85949·18	−2·60
Monte Video	34 54 26 —	85950·27	85952·77	−2·50
Greenwich	51 28 40 N.	86014·49	86016·44	−1·95
London (F)	51 31 8 —	86014·83	86016·60	−1·77
London (B)	51 31 26 —	86016·42	86016·62	−0·20
Staten Island	54 46 23 S.	86029·89	86028·76	+1·03
Cape Horn	55 51 20 —	86033·22	86032·72	+0·50
South Shetland	62 56 11 —	86059·88	86056·84	+3·04

By treating the results of the experiments with the other pendulums (as given in the table in page 69) in a similar manner, we obtain for each of them as follow: viz.

For the invariable Brass pendulum No. 11,

$$7404006991 - v^2 - \cdot 2851280 \times y = 0$$
$$- 2114132612 + \cdot 2851280 \times v^2 + \cdot 1608819 \times y = 0$$
$$y = 38235200$$
$$v^2 = 7393105063$$
$$g = \cdot 00517174$$
$$\frac{1}{c} = \frac{1}{287 \cdot 46}$$

For the Iron pendulum, knife edge A,

$$7423749217 - v^2 - \cdot 3483129 \times y = 0$$
$$- 2589714494 + \cdot 3483129 \times v^2 + \cdot 2211615 \times y =$$
$$y = 39331044$$
$$v^2 = 7410049707$$
$$g = \cdot 00530780$$
$$\frac{1}{c} = \frac{1}{299 \cdot 15}$$

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For the Iron pendulum, knife edge B,

$$7424002663 - v^2 - \cdot 3483129 \times y = 0$$
$$-2589795572 + \cdot 3483129 \times v^2 + \cdot 2211615 \times y = 0$$
$$y = 39264920$$
$$v^2 = 7410326185$$
$$g = \cdot 00529868$$
$$\frac{1}{c} = \frac{1}{298 \cdot 34}$$

For the Copper pendulum, knife edge A,

$$7422115702 - v^2 - \cdot 2795013 \times y = 0$$
$$-2078170454 + \cdot 2795013 \times v^2 + \cdot 1726463 \times y = 0$$
$$y = 38901787$$
$$v^2 = 7411242602$$
$$g = \cdot 00524902$$
$$\frac{1}{c} = \frac{1}{293 \cdot 99}$$

For the Copper pendulum, knife edge B,

$$7421894725 - v^2 - \cdot 2795013 \times y = 0$$
$$-2078100800 + \cdot 2795013 \times v^2 + \cdot 1726463 \times y = 0$$
$$y = 38815419$$
$$v^2 = 7411045765$$
$$g = \cdot 00523751$$
$$\frac{1}{c} = \frac{1}{293 \cdot 00}$$

The following table will exhibit a view of the errors, or differences between the observed number of vibrations, and the number computed from the values of v and g, as deduced, for each separate pendulum, agreeably to the above equations respectively.

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Stations.	Latitude.	Brass.		Iron.		Copper.	
		No. 10.	No. 11.	A.	B.	A.	B.
Para.	° ′ ″ 1 27 0 S	−3·89	−4·21	−1·73	−1·12	−2·53	−2·53
Maranham	2 31 35 −	−6·09	−6·69	. . .	. . .	−4·38	−4·82
Fernando de Noronha	3 49 59 −	+6·76	+6·17	. . .	. . .	. . .	. . .
Ascension.	7 55 23 −	+3·68	+3·33	+6·33	+5·29	+4·80	+5·37
Porto Bello	9 32 30 N	+1·73	+2·58	. . .	. . .	. . .	. . .
Trinidad	10 38 55 −	−4·62	−4·10	−2·89	−2·63	−3·70	−3·94
St. Helena	15 56 7 S	+6·84	+6·56	. . .	. . .	+8·29	+8·27
Cape of Good Hope .	33 54 37 −	−2·60	−2·31	−1·95	−1·93	−2·68	−1·91
Monte Video	34 54 26 −	−2·50	−2·75	. . .	. . .	. . .	. . .
Greenwich	51 28 40 N	−1·95	−1·57	. . .	. . .	. . .	. . .
London (F)	51 31 8 −	−1·77	−0·65	. . .	. . .	. . .	. . .
London (B)	51 31 28 −	−0·20	−0·84	−2·25	−1·65	−2·39	−2·39
Staten Island	54 46 23 S	+1·03	+2·98	+1·11	+0·34	+1·64	−0·07
Cape Horn	55 51 20 −	+0·50	+1·52	. . .	. . .	. . .	. . .
South Shetland . . .	62 56 11 −	+3·04	. . .	+1·38	+1·71	+0·93	+2·05

The values given in the above table clearly show that the vibrations of a pendulum are powerfully affected, in many places, by the local attraction of the substratum on which it is swung; or by some other direct influence at present unknown to us; and the effect of which far exceeds the errors of observation. For, it will be seen, from an inspection of this table, that all the pendulums tell the same story, at the same place: and although they do not all indicate the same magnitude of intensity (the cause of which I shall presently explain), yet the values are too great and too uniform to be caused solely by the errors of observation. And we shall see, in the sequel, that these anomalies are in a great degree confirmed by other voyagers, who have visited some of the same places, and made experiments there with other pendulums.

But, it must not be concealed, that the developement of the intensity, as well as the apparent existence of this influence, depends very much on the number and geological character of the stations at which the experiments have been made: since our knowledge of such influence is derived solely from a comparison of results at different places. Thus, it will be seen that the results deduced from the pendulum No. 10, which was swung at 15 stations, differ (though slightly) from those deduced from the pendulum No. 11, which was

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swung at 14 stations only. Again, the results deduced from the iron pendulum, which was swung at 7 stations, differ from those deduced from the copper pendulum, which was swung at 9 stations: and each of these also differ still more from the results with the brass pendulums. In fact, if we suppose that the expedition of Captain Foster were divided into two distinct voyages, in one of which he visited all those stations which, in the preceding table, exhibit a *plus* quantity for the errors; and in the other that he visited all those stations which in the same table exhibit a *minus* quantity for the errors; we should have, for each separate voyage, the whole system of errors completely altered. For, since the values of v, g, and c would be materially affected by such a condition, we should find that several of the errors, or differences, which are now *plus*, would in such case be *minus*; and vice versa: and others which, although retaining the same sign, would be considerably diminished in magnitude.

The following table will show the effect of the case above alluded to: where I have separated all the stations at which the pendulum No. 10 was swung, and which, in the table in page 75, exhibit a *plus* difference, from those which exhibit a *minus* difference; and have computed their results, independently of each other.

By selecting all the stations where the differences are now *plus*.

$v = 85884 \cdot 26$
$g = \cdot 00511382$
$\frac{1}{c} = \frac{1}{282 \cdot 75}$

By selecting all the stations where the differences are now *minus*.

$v = 85874 \cdot 66$
$g = \cdot 00535382$
$\frac{1}{c} = \frac{1}{303 \cdot 33}$

Stations.	Vibrations		Difference.	Stations.	Vibrations		Difference.
	observed.	computed.			observed.	computed.	
Fernando de Nor.	85887·26	85885·26	+2·00	Para	85875·76	85874·80	+0·96
Ascension. . . .	85887·44	85888·44	−1·00	Maranham . . .	85873·81	85875·10	−1·29
Porto Bello . . .	85887·39	85890·32	−2·93	Trinidad	85882·54	85882·50	+0·04
St. Helena . . .	85903·24	85900·80	+2·44	Cape of G. Hope .	85946·58	85946·20	+0·38
Staten Island . .	86029·89	86030·68	−0·79	Monte Video . .	85950·27	85949·90	+0·37
Cape Horn . . .	86033·22	86034·56	−1·34	Greenwich . . .	86014·49	86015·26	−0·77
South Shetland .	86059·88	86058·24	+1·64	London (F). . .	86014·83	86015·42	−0·59
				London (B) . .	86016·42	86015·48	+0·94

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If we compare the differences, here given, with those stated in the table in page 75; and the values of v, g, and c, with those deduced in page 74; we may soon be convinced of the powerful influence of some of the stations on the final results of the vibrations of the pendulum: and that the slight anomalies, arising from the probable errors of observation, vanish before these enormous discordancies. In order to eliminate these discordancies, or to discover the seat and cause of them, and thus evade their influence on the results of our enquiries, we must multiply the observations of the pendulum in as many *places* as possible: since it is only by such a measure we can expect to obtain a general result which shall express, with the requisite degree of accuracy, the figure of the earth.*

These remarks further show that in reductions of this kind, where only a portion of the pendulums has been swung at some of the stations (as in the present voyage), we cannot take the mean of the separate errors, or differences, of each pendulum, at any one place, as given in the table in page 77, for the mean error of the whole at such place: neither can we obtain a mean value of v, g, and c, by taking the mean of the values deduced for each pendulum, agreeably to the deductions in pages 75 and 76. But, in order to get a correct mean result at each place from the totality of the experiments thus made during any one voyage, we must combine together the results of all the observations, made at one and the same place by the different pendulums employed, by reducing them all to the same common rate; or by assuming that all the pendulums have made the same number of vibrations at some one station, at which they have all been swung (at London, for instance); and thence computing, by direct proportion, what number of vibrations each pendulum would, under such circumstances, have made at the several stations at which it had been subsequently swung. Thus, let the number of vibrations actually made at London, by any given pendulum, be denoted by n, and that it is required to reduce the results at all the stations to one uniform rate, which we will suppose to be that of a pendulum vibrating seconds in London: in this case we have only to multiply the results at all the stations, by the common factor $\frac{86400}{n}$.

Now, if we assume the mean of the results with the brass pendulums, No. 10

* As another instance of the effect of limited stations on the general results, I would here remark that from Captain LEUTKE's experiments at 9 stations, which will be noticed in the sequel, the difference at Valparaiso was $-6\cdot52$, and at the Bonin Islands $+6\cdot46$ vibrations: but, when these experiments are amalgamated with those of other observers, the former is reduced above one half, and the latter is almost doubled.

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and 11, given in the table in page 69, as the correct results with those pendulums; and the mean of the results with the knife edges A and B of the iron pendulum, as the correct results with the iron pendulum; and the mean of the results with the knife edges A and B of the copper pendulum, as the correct results with the copper pendulum; we shall have $\frac{86400}{86067\cdot10}$, $\frac{86400}{86220\cdot28}$, and $\frac{86400}{86223\cdot83}$, respectively for the several factors, by which the values at each station are to be multiplied. Whence we obtain the following equivalent and comparative values, expressed in terms of the seconds pendulum in London. And I would remark that the two stations in London are here reduced into one, for the mean latitude 51° 31′ 17″.*

Stations.	Latitude.	Brass.	Iron.	Copper.	Mean.
Para	1° 27′ 0″ S	86259·76	86260·58	86261·50	86260·61
Maranham	2 31 35 —	86257·74	. . .	86259·74	86258·74
Fern. de Noronha .	3 49 59 —	86271·20	. . .	. . .	86271·20
Ascension	7 55 23 —	86271·48	86272·02	86273·28	86272·26
Porto Bello	9 32 30 N	86272·01	. . .	. . .	86272·01
Trinidad	10 38 55 —	86266·98	86266·92	86267·82	86267·24
St. Helena	15 56 7 S	86287·32	. . .	86289·26	86288·29
Cape of G. Hope .	33 54 37 —	86330·94	86331·08	86331·96	86331·33
Monte Video . . .	34 54 26 —	86334·36	. . .	. . .	86334·36
Greenwich	51 28 40 N	86398·90	. . .	. . .	86398·90
London	51 31 17 —	86400·00	86400·00	86400·00	86400·00
Staten Island . . .	54 46 23 S	86415·06	86415·12	86415·48	86415·22
Cape Horn	55 51 20 —	86417·98	. . .	. . .	86417·98
South Shetland . .	62 56 11 —	86444·44 †	86444·60	86444·52	86444·52

* On examining the results with the brass and copper pendulums, at the several stations, it is impossible not to be struck with the *difference in the variation* in the number of their vibrations. This difference of variation appears to be least at the cold region of South Shetland, and to increase as we approach the warm climate of the equator: the maximum being at Maranham. No alteration in the assumed rate of the expansion of the metals, consistent with probability, will account for this singular fact. The difference in the variation of the iron pendulum pursues nearly the same law; but is not so great in amount.

† This value has been deduced by means of the factor 1·004470: as only one of the brass pendulums has been employed in obtaining the results.

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The mean values in the last column are those which must be taken, in order to deduce the figure of the earth from the totality of the observations: and by forming them into equations of condition, in the manner already pointed out in page 73, we obtain the following resulting equations: viz.

$$7453029922 - v^2 - \cdot 2979961 \times y = 0$$
$$-2224460597 + \cdot 2979961 \times v^2 + \cdot 1789724 \times y = 0$$
$$y = 38666418$$
$$v^2 = 7441507482$$
$$g = \cdot 00519605$$
$$\frac{1}{c} = \frac{1}{289 \cdot 48}$$

The general expression therefore for the number of vibrations made by an invariable pendulum, which beats seconds in London, at any station whose latitude is L, will be, according to the totality of Captain FOSTER's experiments,

$$V = \left(7441507482 + 38666418 \sin^2 L\right)^{\frac{1}{2}}$$

And this is the *final result* which I obtain from the whole of his experiments.

The following table will show the observed mean value at each station, as well as the computed values; together with the error, or difference, which arises from this combined result of the whole.

Comparison of the final results of Capt. FOSTER's Experiments.

Stations.	Latitude.	Vibrations		Difference.
		observed.	computed.	
Para	1° 27′ 0″ S.	86260·61	86264·30	−3·69
Maranham	2 31 35 —	86258·74	86264·60	−5·86
Fernando de Noronha . .	3 49 59 —	86271·20	86265.16	+6·04
Ascension	7 55 23 —	86272·25	86268·44	+3·81
Porto Bello	9 32 30 N.	86272·01	86270·32	+1·69
Trinidad	10 38 55 —	86267·24	86271·84	−4·60
St. Helena	15 56 7 S.	86288·29	86281·06	+7·23
Cape of Good Hope . . .	33 54 37 —	86331·33	86333·90	−2·57
Monte Video	34 54 26 —	86334·36	86337·52	−3·16
Greenwich	51 28 40 N.	86398·90	86410·24	−2·34
London (F and B) . . .	51 31 17 —	86400·00	86401·40	−1·40
Staten Island	54 46 23 S.	86415·22	86413·58	+1·64
Cape Horn	55 51 20 —	86417·98	86417·54	+0·44
South Shetland	62 56 11 —	86444·52	86441·72	+2·80

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The values in the last column indicate most clearly that the pendulum is powerfully affected by local circumstances; since the differences between the observed and computed results, in most of the cases, far exceed the probable errors of observation. And it is worthy of remark that the force of gravity seems to be greater in islands, at a distance from the main land (such as Ascension, St. Helena, Fernando de Noronha, &c.) than it is on continents. In order, however, to show more clearly the true relative effect of the influence of such places, it will be requisite to combine the results of experiments made at a greater number of stations: and, for this purpose, I shall now proceed to combine the results of all the experiments hitherto made with the *invariable* pendulum, as far as the same have come to my knowledge. I shall not include, in this general view, any of the experiments made by other means for the purpose of determining the *length* of the seconds pendulum at any given station; since the results of such experiments have (with the exception of those made by M. Bessel) been hitherto mixed up with an erroneous correction for the *reduction to a vacuum*, and are therefore not strictly and directly comparable with those made with an *invariable* pendulum, whose *comparative* results (on account of the similarity in the form of the pendulums hitherto employed) are not materially affected by the alteration in such correction; or, if so, can be easily rectified by applying the true correction.

General results of all the experiments hitherto made with the invariable pendulum.

For the purpose of this general comparison I shall employ, in addition to the above experiments, those made by the following experimentalists: in all of which the same kind of invariable brass pendulum has been employed; if we except two of those taken out by Captain Freycinet, and one of those taken out by Captain Duperrey, where the bob was supported by a cylindrical rod, instead of a thin bar. All the results are reduced to the temperature of 62° Fahrenheit, to a vacuum, and to the level of the sea: and the true correction for the buoyancy of the atmosphere has been in all cases applied.

1. *Kater.* These experiments were made, in various parts of England and Scotland, in the year 1819; and the details are given in the *Phil. Trans.* of that year. The following are the results at the different stations, after applying the true correction for the buoyancy of the atmosphere, as is given in page 27.

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Place.	Latitude.			Vibrations corrected.
	°	′	″	
Shanklin Farm	50	37	24 N.	86061·77
London	51	31	8—	86065·54
Arbury Hill	52	12	55—	86069·00
Clifton	53	27	43—	86072·79
Leith Fort	55	58	41—	86083·29
Portsoy	57	40	59—	86089·96
Unst	60	45	28—	86100·61

The only station, in common with either of those at which Captain FOSTER swung the pendulum, is that of London: the above values therefore must be multiplied by the factor $\frac{86400}{86065 \cdot 54}$, in order to render them comparable with the final results of Captain FOSTER, in page 80.

2. *Goldingham.* These experiments were made, first in London, and next at Madras: the particulars of which are given in the *Phil. Trans.* for 1822. An expedition was afterwards sent out, by the East India Company, to swing the same pendulum at a small island, called Pulo Gaunsah Lout, lying nearly under the equator on the western coast of Sumatra, in E. Long. $6^h\ 35^m\ 20^s$, and N. Lat. 0° 1′ 49″: the particulars of which, detailed at great length, are given in a large folio volume, printed (for private distribution only) by the East India Company. The following are the results at the three places, after reducing them to the temperature of 62°, to the level of the sea, and applying the true correction for the buoyancy of the atmosphere.

Place.	Latitude.			Vibrations corrected.
	°	′	″	
Pulo Gaunsah Lout . .	0	1	49 N.	86173·36
Madras	13	4	9—	86179·06
London	51	31	8—	86306·56

As the only station here, also, in common with Captain FOSTER's list, is London, we must multiply these values by the factor $\frac{86400}{86306 \cdot 56}$, in order to render them comparable with his results.

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3. *Hall.* These experiments were made, in a voyage to the Pacific Ocean in the years 1820—23; the particulars of which are given in the *Phil. Trans.* for 1823. (See also page 3, *supra.*) The following are the results, after reducing them to the temperature of 62°, and applying the true correction for the buoyancy of the atmosphere.

Place.	Latitude.	Vibrations corrected.
Galapagos	0° 32′ 0″ N.	86107·64
San Blas	21 32 24 —	86131·87
Rio Janeiro	22 55 22 S.	86137·96
London	51 31 8 N.	86242·87

As the only station here also, in common with Captain Foster's list, is London, we must multiply these values by the factor $\frac{86400}{86242\cdot87}$, in order to render them comparable with his results.

4. *Brisbane.* In the year 1822, Sir Thomas Brisbane took out with him to Paramatta, an invariable pendulum, which had been previously swung in London. The particulars are given in the *Phil. Trans.* for 1823. The following are the results after reducing them to the temperature of 62°, to the level of the sea, and applying the true correction for the buoyancy of the atmosphere.

Place.	Latitude.	Vibrations corrected.
Paramatta	33° 48′ 43″ S.	86024·74
London	51 31 8 N.	86093·00

These values must be multiplied by the factor $\frac{86400}{86093}$, in order to render them comparable with Captain Foster's.

5. *Sabine* (I).* These experiments were made in various parts of the

* The subsequent experiments, made by Captain Sabine, for determining the difference in the number of vibrations between those made at London, and at Paris, Greenwich, and Altona, will be found in the sequel, numbered (II), (III), and (IV).

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Atlantic Ocean, and afterwards in the North seas, in the years 1822—24, during two voyages undertaken for that purpose: the particulars of which are to be found in Captain SABINE'S *Account of Experiments, &c.* 1825, 1 volume in quarto. Captain SABINE took out with him two pendulums, numbered 3 and 4; and I have taken the mean of the two, as given by him in page 236, of his work just alluded to. The following are the results at the several stations, after making the corrections pointed out in the *Phil. Trans.* for 1828, page 76, and also after applying the true correction for the buoyancy of the atmosphere, and deducting 0·21 vibration for the error arising from the inaccurate scale of the arc of vibration, as mentioned by him in page 210 of his work. It may be proper here to state that I have assumed the rate of expansion the same as in the reduction of Captain FOSTER'S experiments; and therefore the true correction for the buoyancy of the atmosphere will make a somewhat greater difference than is supposed by Captain SABINE, in *Phil. Trans.* for 1829, page 238.

Place.	Latitude.	Vibrations corrected.
	° ′ ″	
St. Thomas	0 24 41 N.	86032·97
Maranham	2 31 43 S.	86023·33
Ascension	7 55 48—	86036·69
Sierra Leone	8 29 28 N.	86031·67
Trinidad	10 38 56—	86030·91
Bahia	12 59 21 S.	86036·51
Jamaica	17 56 7 N.	86048·74
New York	40 42 43—	86121·94
London	51 31 8—	86163·48
Drontheim	63 25 54—	86202·31
Hammerfest	70 40 5—	86224·75
Greenland	74 32 19—	86234·31
Spitzbergen	79 49 58—	86246·80

The stations, in this list, in common with those at which Captain FOSTER swung the pendulum, are Maranham, Ascension, Trinidad, and London: whereby we find that the mean ratio which the mean of these two pendulums bears to the mean of Captain FOSTER'S pendulums, as given in the table in page 80, is 1·0027417; and which is the factor by which all the values in the above table

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must be multiplied, in order to render them comparable with Captain Foster's final results.*

6. *Foster (North Pole).* On the return of Captain Sabine to England, Captain Parry was about to commence his third voyage towards the North Pole: and one of the pendulums (No. 3) was delivered to Captain (then Lieutenant) Foster. With this pendulum, furnished with a new set of agate planes, experiments were made, first at Greenwich, prior to the sailing of the expedition, afterwards at Port Bowen, where the ships wintered, and again at Greenwich on their return. The details are given in the *Phil. Trans.* for 1826: and the following are the results, after reducing them to the temperature of 62°, and applying the true correction for the buoyancy of the atmosphere.

Place.	Latitude.	Vibrations corrected.
Greenwich	51° 28′ 40″ N.	86158·40
London	51 31 8—	86158·84
Port Bowen.	73 13 39—	86229·25

The stations in this list, in common with those at which Captain Foster swung the pendulum in his recent voyage, are Greenwich and London: but we may also include Maranham, Ascension and Trinidad, for the purpose of determining the mean ratio which this pendulum bears to the mean of Captain Foster's pendulums, and I shall omit Greenwich, on account of the discordancy at that place, as already mentioned in page 45.† Proceeding in this manner,

* This factor is obtained in the following manner:

$$\text{At Maranham} \ldots \frac{86258\cdot74}{86023\cdot33} = 1\cdot0027367$$

$$\text{At Ascension} \ldots \frac{86272\cdot25}{86036\cdot69} = 1\cdot0027383$$

$$\text{At Trinidad} \ldots \frac{86267\cdot24}{86030\cdot91} = 1\cdot0027470$$

$$\text{At London} \ldots \frac{86400\cdot00}{86163\cdot48} = 1\cdot0027450$$

$$\text{Mean ratio} = 1\cdot0027417$$

And it is in this manner that the subsequent mean ratios have been deduced.

† If Greenwich be included, the resulting values would be diminished 0·26 vibration. And if we reject Maranham, Ascension and Trinidad, on account of the difference of the planes (see the note in page 45), the resulting values would be increased 0·30 vibration.

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we find that the mean ratio is 1·0027979, and which is the factor by which all the values in the preceding table must be multiplied in order to make them comparable with the final results of Captain FOSTER in his late voyage to the south.

7. *Fallows.* The other pendulum (No. 4) employed by Captain SABINE was, on his return, forwarded to the Rev. F. FALLOWS, Astronomer at the Observatory at the Cape of Good Hope; where several series of experiments were made; the pendulum also having been swung in London by Captain RONALD previous to its departure. The details are given in the *Phil. Trans.* for 1830; and the following are the results after reducing them to the level of the sea, and applying the proper correction for the buoyancy of the atmosphere. I would likewise remark that I have added the result of Captain RONALD'S experiments made in London, to those made by Captain SABINE on the same pendulum, as given by him in his *Account of Experiments, &c.* page 236 (the true correction for the buoyancy of the atmosphere being also applied in this case), and have taken the mean of the two, as the proper value.*

Place.	Latitude.	Vibrations corrected.
Cape of Good Hope . .	33° 55′ 56″ S.	86101·64
London	51 31 8 N.	86168·50

Both these stations are included in Captain FOSTER'S list. but we may also, as in the preceding case, include Maranham, Ascension and Trinidad, for the purpose of determining the mean ratio between this pendulum, and the mean of Captain FOSTER'S. This ratio will be found to be 1·0026820; and which is the factor by which the values in the preceding table must be multiplied in order to make them comparable with the mean of Captain FOSTER'S final results.

8. *Sabine* (II). In the year 1827 Captain SABINE swung two pendulums (numbered 7 and 8) in London and in Paris, for the express purpose of determining the difference in the number of vibrations, between these two places. The details are given in the *Phil. Trans.* for 1828; and the results are as

* Mr. FALLOWS'S experiments were made prior to the completion of the Observatory, in a small out-house, at a short distance from the building; and the time was determined by means of a 20-inch transit.

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follow, after reducing them to the temperature of 62°, and making the requisite correction for the heights of the stations above the mean level of the sea, and applying the true correction for the buoyancy of the atmosphere.

Place.	Latitude.	Vibrations corrected.
Paris	48° 50′ 14″ N.	85930·86
London	51 31 8—	85942·49

The difference here is only 11·63 vibrations; and not 12·05 as stated by Captain Sabine.* As London is the only station in common with any in Captain Foster's list, we have $\frac{86400}{85942 \cdot 49}$ for the factor, by which the above values must be multiplied, in order to render them comparable with his results.

9. *Sabine* (III). In the same year Captain Sabine also swung a pendulum (numbered 12) at London and at Greenwich, for a similar purpose. The details are given in the *Phil. Trans.* for 1829; and the results are as follow, after applying the proper correction for the heights of the stations above the mean level of the sea. It may be proper to state that the values here given are the mean results of the two series made before and after the knife edge was reground: and that Captain Sabine has himself applied the proper correction for the buoyancy of the atmosphere.

Place.	Latitude.	Vibrations corrected.
Greenwich	51° 28′ 40″ N.	85972·37
London	51 31 8—	85971·70

The difference here is 0·67 vibration; and not 0·48 as stated by Captain Sabine: but they both differ very materially from the results deduced from Captain Foster's experiments, as already noticed in page 45. Both these stations are included in Captain Foster's list, but I shall omit Greenwich, on

* This difference arises partly from an error in Captain Sabine's computation, and partly from his omitting to reduce the results to the level of the sea.

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account of the discordancy at that place, already mentioned in page 45: we have therefore $\frac{86400}{86971 \cdot 70}$ for the ratio by which the above values must be multiplied, in order to make them comparable with his results.

10. *Sabine* (IV). The same pendulum, after the knife edge had been re-ground, as above alluded to, was taken by Captain SABINE to Altona; where a series of experiments was made with it, at Professor SCHUMACHER'S observatory: and again at Greenwich on its return. The details are given in the *Phil. Trans.* for 1829, and 1830; and the following are the results, after reducing them to the temperature of 62°, and applying the correction for the heights of the stations above the level of the sea. The proper correction for the buoyancy of the atmosphere has been applied by Captain SABINE.

Place.	Latitude.	Vibrations corrected.
Greenwich	51° 28′ 40″ N.	85970·33
London	51 31 8—	85969·59
Altona	53 32 45—	85978·54

The two stations, in common with those in Captain FOSTER'S list, are Greenwich and London: but, as we must here also omit Greenwich, for the reasons just stated, we have $\frac{86400}{85969 \cdot 59}$ for the ratio between this pendulum and the mean of Captain FOSTER'S pendulums; and which is the factor by which the above values must be multiplied, in order to make them comparable with his results.

11. *Freycinet.* In the year 1817, the French Government fitted out a scientific expedition, to make a voyage round the world, under the command of Captain FREYCINET: one of whose objects was to swing the pendulum at various places. For this purpose he was furnished with three invariable brass pendulums, numbered 1, 2, and 3: the latter of which was formed in the same manner as KATER'S pendulum, namely, a heavy bob fastened to a *flat bar;* but the two former were each furnished with a solid *cylindrical rod,* about half an inch in diameter.* The detail of the experiments made with these pendulums

* There was also a fourth pendulum, furnished with a *wooden* rod: but I shall not notice the results with this instrument.

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is published in a separate volume, in quarto. It appears that, on this occasion, a new mode of determining the coincidences was adopted: but, as I consider the old method (particularly when all the four phenomena are observed, see page 27) as unexceptionable, and not liable to any appreciable error, I shall not dwell on this subject; more especially as I presume it will not be again adopted.* Whether it be owing to this circumstance, or to the imperfection of the chronometers, or to the mode of determining the time (no transit instrument having been employed), it may perhaps be difficult to decide; but the fact is certain, that considerable anomalies are discoverable in the results, at several of the stations. I have already noticed some of these discrepancies in the former part of this Report (see page 30): and others are apparent on minutely examining the details.† The circumstance, however, of *three* separate pendulums having been employed, will tend very much to eliminate the unavoidable errors of observation, which occur in a voyage of this kind. The mean results of the three pendulums, at the several stations, are given by Captain Freycinet, in sexagesimal seconds, in page 41 of his Memoir: these are here also given in the following table, reduced from 20° of the Centigrade thermometer (= 68° Fahr.) to 62° of Fahrenheit; assuming the expansion to be the same as in the English pendulums: and applying the proper correction for the buoyancy of the atmosphere.‡

* See Captain Sabine's remarks on this method, in *Phil. Trans.* for 1828, page 38.

† See the results, in the general table in page 97, at the Falkland (or Malouine) Islands, as compared with those of Captain Duperrey: also the results at Guam, as compared with those of Captain Leutke. At the former place, the pendulum No 2, only, was employed.

‡ This correction has been determined by multiplying the corrections for buoyancy, given by Captain Freycinet in pages 219, &c. of his Memoir, by 1·59 (which is the factor, found by me, for the old correction, as stated in the *Phil. Trans.* for 1832, page 427), and then diminishing the product in the ratio of $\frac{86400}{89800}$. This is on the assumption that the pendulums No. 2 and 3 require the same factor, as the pendulum No. 3: but, I have shown, in the *Phil. Trans.* above quoted, page 430, that a pendulum with a *cylindrical* rod requires a different factor from that of a *flat* rod. The true factor can only be ascertained by actual experiment.

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Place.	Latitude.			Vibrations corrected.
	°	′	″	
Rawak *	0	1	34 S.	86279·35
Guam	13	27	51 N.	86300·86
Isle of France	20	9	56 S.	86315·97
Mowi	20	52	7 N.	86315·41
Rio Janeiro.	22	55	13 S.	86311·39
Port Jackson	33	51	34—	86351·96
Cape of Good Hope . .	33	55	15—	86349·48
Paris	48	50	14 N.	86406·00
Falkland Island	51	35	18 S.	86414·64

The only station, strictly in common with any of those in Captain FOSTER's list, is the Cape of Good Hope: but, if we take advantage of Captain SABINE's determination of the difference in the results between Paris and London, as above stated, and subtract 11·63 vibrations from Captain FOSTER's determination in London, we may obtain a comparison with two stations. Proceeding in this manner, I find the mean ratio of these pendulums, to the mean of Captain FOSTER's pendulums, to be ·9997927; and which is the factor by which the above values must be multiplied, in order to render them comparable with his results.

12. *Duperrey.* On the return of Captain FREYCINET, another expedition was sent out by the French Government, under the command of Captain DUPERREY; whose object also was to swing the pendulum at various stations. For this purpose he took out two of the same pendulums (No. 1 and No. 3) that had been used by Captain FREYCINET: and he also adopted the same mode for observing the coincidences. The details of these experiments are given in the *Connaissance des Tems* for 1830: and the following are the results, after reducing them to 16°·7 of the centesimal thermometer, which is equal to 62° Fahrenheit,

* It may be convenient to the reader to state here, that the island of Rawak is situated almost under the equator, near the coast of New Guinea, in E. Long. $8^h\ 43^m\ 41^s$: that Guam is the capital of the Marianne or Ladrone Islands, in E. Long. $9^h\ 39^m\ 51^s$: that Mowi is one of the Sandwich Islands, in W. Long. $10^h\ 26^m\ 47^s$: that at the Isle of France, the experiments were made at Port Louis: and that at the Falkland (or Malouine) Islands, the experiments were made in French Bay, in W. Long. $3^h\ 52^m\ 27^s$.

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and applying the true correction for the buoyancy of the atmosphere.* At the island of Ascension, and at the Isle of France, the pendulum No. 3 only was swung: I have therefore previously multiplied the results obtained with that pendulum at those places, by the mean ratio (=1·0009360) between the pendulum No. 1 and the mean of the two pendulums No. 1 and No. 3.

Place.	Latitude.	Vibrations corrected.
Ascension	7° 55′ 48″ S.	90132·96
Isle of France	20 9 23—	90159·63
Port Jackson	33 51 40—	90196·55
Toulon	43 7 20 N.	90232·31
Paris	48 50 14—	90254·65
Falkland Island	51 31 44 S.	90266·44

The only new station in this list is that of Toulon: and the only station strictly in common with any in Captain Foster's list, is that of Ascension; unless, as in the preceding case, we take advantage of Captain Sabine's determination of the difference in the results between Paris and London. By pursuing this mode we obtain ·9571646 for the mean ratio of these pendulums to the mean of Captain Foster's pendulums: and which is the factor by which the above values must be multiplied in order to make them comparable with his results.

13. *Leutke.* The Russian Government also has sent out an expedition, under the direction of Captain Leutke, which had for its object, amongst other things, the swinging of the pendulum at various places. The only account, which I have seen, of the results of these experiments, is in the *Bulletin scientifique* annexed to the *Mémoires de l'Acad. Imp. des Sciences de St. Petersburgh*, 6th series, vol. i. 1830.† It would appear from that short statement that the pendulum employed by Captain Leutke is the same as that used by Captain Hall: but, if so, it must have undergone some alteration, as it does not now make precisely the same number of vibrations, as when it was in Captain Hall's

* This correction has been determined by multiplying the old correction by $1\cdot59 \times \frac{86400}{90180}$: see the note in page 90.

† See a translation of this paper, in the *Phil. Mag.* for December 1832.

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possession.* Before quitting England, Captain LEUTKE made a series of experiments with this pendulum at Greenwich; and again, on his return to this country: the results differed only 0·60 vibration from each other. He assumes the correction for the rate of expansion to be 0·458 vibration for each degree of Fahrenheit, deduced from some experiments made by himself at St. Petersburg, for this express purpose; which is 0·035 greater than the correction adopted by most other experimentalists. The following are the results at the several stations: but I must previously state that with respect to the true correction for the buoyancy of the atmosphere, I am obliged, for want of the requisite data, to assume an approximate value. I have therefore increased the number of vibrations, given by Captain LEUTKE, at the first three stations, by 3·80; the next three, by 3·90; and the last three, by 4·00. This is founded on the scale of increase observed at Captain SABINE's stations, under nearly similar latitudes; and, I trust, will not differ much from the truth.

Place.	Latitude.	Vibrations corrected.
Ualan †	5° 21′ 16″ N.	86116·63
Guam	13 26 21—	86121·78
St. Helena	15 54 59 S.	86129·43
Bonin Island	27 4 12 N.	86163·14
Valparaiso	33 2 30 S.	86169·23
Greenwich	51 28 40 N.	86240·18
Petropaulouski.	53 0 53—	86249·83
Sitka	57 2 58—	86261·44
Petersburg	59 56 31—	86273·08

* The mean result of Captain HALL's experiments at London, with the old correction for the buoyancy of the atmosphere, and reduced to the temperature of 62° (which is that assumed by Captain LEUTKE) is exactly 86239 vibrations: being a difference of 3·20 vibrations from that adduced by Captain LEUTKE in his Memoir. It is probable, however, that the knife edge was reground: as it was removed from the pendulum, and found to be distinctly rounded. See *Phil. Trans.* for 1823, page 288*.

† It may be convenient to the reader to be informed that Ualan is one of the Caroline Islands, in E. Long. $10^h\ 52^m$: and that Sitka is situate on the North West coast of America, in W. Long. $9^h\ 0^m$. The Bonin Islands lie off the South East coast of Japan in E. Long. $9^h\ 28^m$; and may be considered as a recent discovery. They are described by Captain BEECHEY, in his *Narrative of a Voyage to the Pacific*, vol. ii. page 227, &c. They consist of three clusters of islands: to the southernmost of which he has done me the honour to attach my name.

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In Captain Leutke's table of results he has given the number of vibrations at London (and not at Greenwich) by applying the difference found by Captain Sabine, namely 0·48: but I have considered it better to insert the correct values at the actual place of observation, by restoring the original value. The only two stations in common with those in Captain Foster's list, are St. Helena and Greenwich: but, on account of the discordancy in Captain Foster's results at Greenwich (see page 45),* we must omit that place, and deduce the ratio from the results at St. Helena only; whereby we obtain $\frac{86288 \cdot 29}{86129 \cdot 43}$ for the ratio between this pendulum and the mean of Captain Foster's pendulums; and which is the factor by which all the values must be multiplied, in order to make them comparable with his results.

These are all the observations that I have been able to collect, and which, I believe, have yet been published, relative to experiments with the invariable pendulum.† By reducing them all to a comparison with the same common standard of Captain Foster's mean pendulum (which is assumed as making 86400 vibrations in a mean solar day in London), in the manner above stated, and arranging them into equations of condition, as already described in page 73, we obtain 79 equations, (including the duplicates at London, Greenwich and a few other places): then forming them into equations of minimum, with respect to v^2 and y, we ultimately obtain the following values as the general result of all these comparisons: viz.

$$7456740031 - v^2 - \cdot 3947701 \times y = 0$$
$$-2947088917 + \cdot 3947701 \times v^2 + \cdot 2444144 \times y = 0$$
$$y = 38286335$$
$$v^2 = 7441625711$$
$$g = \cdot 00514491$$
$$\frac{1}{c} = \frac{1}{285 \cdot 26}$$

The general expression therefore for the number of vibrations made by an invariable pendulum, which beats seconds in London, at any station whose latitude is L, will be, according to the totality of all the experiments hitherto made,

$$V = \left(7441625711 + 38286335 \sin^2 L\right)^{\frac{1}{2}}.$$

And this is the *final result* which I obtain from the whole of such experiments.

* If Greenwich were included, the results would be diminished only 0·18 vibration.

† Captain Leutke alludes to the pendulum experiments made by Captain Kotzebue: but I have not yet seen any account of those experiments.

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The following table will show the *observed* value at each station (corrected where requisite for any deviation from the standard temperature of 62°, or from the true correction for the buoyancy of the atmosphere; and afterwards reduced to a comparison with Captain FOSTER'S mean pendulum, assumed as making 86400 vibrations in a mean solar day at London); together with the *computed* value, according to the data here deduced. In a collateral column are given the differences, arising either from local attraction or from errors of observation; to which are annexed the names of the observers. In this last column, where the mark (N. P.) is attached to Captain FOSTER'S name, it implies that the stations are those at which he swung the pendulum, on the occasion of his voyage to the North Pole: and where the marks (Alt.) (Gr.) and (Paris) are attached to Captain SABINE'S name, it implies that the stations are those at which he swung the pendulum, on the three separate journies which he made to Altona, Greenwich, and Paris, for the express purpose of determining the difference in the number of vibrations between London, and those places respectively.* It is necessary to make this distinction in the cases, lest they should be confounded with the stations in the more extensive voyages of these two observers. Where two or more observers have visited the same stations, the results obtained by each are kept separate and distinct for the purpose of comparison: and, as I have not in all cases been able to ascertain the precise spot at which the pendulum has been swung, I have uniformly preserved the latitude as given by each observer; however minute the difference may be.

* See the Note in page 84.

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No.	Station.	Latitude.	Vibrations observed.	Vibrations computed.	Difference.	Observer.
1	Rawak	0° 1′ 34″ S.	86261·46	86264·86	−3·40	Freycinet.
2	Pulo Gaunsah Lout .	0 1 49 N.	86266·64	86264·86	+1·78	Goldingham.
3	St. Thomas	0 24 41—	86268·84	86264·87	+3·97	Sabine.
4	Galapagos	0 32 19—	86264·56	86264·88	−0·32	Hall.
5	Para	1 27 0 S.	86260·61	86265·00	−4·39	Foster.
6	Maranham	2 31 35—	86258·74	86265·30	−6·56	Foster.
7	Ditto	2 31 43—	86259·19	86265·30	−6·11	Sabine.
8	Fernando de Noronha.	3 49 59—	86271·20	86265·86	+5·34	Foster.
9	Ualan	5 21 16 N.	86275·44	86266·78	+8·66	Leutke.
10	Ascension.	7 55 23 S.	86272·26	86269·06	+3·20	Foster.
11	Ditto	7 55 48—	86272·06	86269·08	+2·98	Duperrey.
12	Ditto	7 55 48—	86272·56	86269·08	+3·48	Sabine.
13	Sierra Leone	8 29 28 N.	86267·54	86269·70	−2·16	Sabine.
14	Porto Bello	9 32 30—	86272·01	86270·96	+1·05	Foster.
15	Trinidad	10 38 55—	86267·24	86272·42	−5·18	Foster.
16	Ditto	10 38 56—	86266·78	86272·42	−5·64	Sabine.
17	Bahia	12 59 21 S.	86272·38	86276·07	−3·69	Sabine.
18	Madras.	13 4 9 N.	86272·36	86276·19	−3·83	Goldingham.
19	Guam	13 26 21—	86280·64	86276·84	+3·80	Leutke.
20	Ditto	13 27 51—	86282·98	86276·90	+6·08	Freycinet.
21	St. Helena	15 54 59 S.	86288·29	86281·54	+6·75	Leutke.
22	Ditto	15 56 7—	86288·29	86281·54	+6·75	Foster.
23	Jamaica	17 56 7 N.	86284·66	86285·90	−1·24	Sabine.
24	Isle of France	20 9 23 S.	86297·60	86291·20	+6·40	Duperrey.
25	Ditto	20 9 56—	86298·08	86291·23	+6·85	Freycinet.
26	Mowi	20 52 7 N.	86297·52	86293·00	+4·52	Freycinet.
27	St. Blas	21 32 24—	86288·80	86294·77	−5·97	Hall.
28	Rio Janeiro	22 55 13 S.	86293·48	86298·52	−5·04	Freycinet.
29	Ditto	22 55 22—	86294·90	86298·52	−3·62	Hall.
30	Bonin Island	27 4 12 N.	86322·06	86310·81	+11·25	Leutke.
31	Valparaiso	33 2 30 S.	86328·16	86330·82	−2·66	Leutke.
32	Paramatta	33 48 43—	86331·48	86333·55	−2·07	Brisbane.
33	Port Jackson	33 51 34—	86334·06	86333·68	+0·38	Freycinet.
34	Ditto	33 51 40—	86332·94	86333·68	−0·74	Duperrey.
35	Cape of Good Hope .	33 54 37—	86331·33	86333·90	−2·57	Foster.
36	Ditto	33 55 15—	86331·58	86333·95	−2·37	Freycinet.
37	Ditto	33 55 56—	86332·56	86333·98	−1·42	Fallows.
38	Monte Video	34 54 26—	86334·36	86337·48	−3·12	Foster.
39	New York	40 42 43 N.	86358·06	86359·22	−1·16	Sabine.
40	Toulon.	43 7 20—	86367·16	86368·48	−1·32	Duperrey.

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No.	Station.	Latitude.	Vibrations observed.	Vibrations computed.	Difference.	Observer.
41	Paris	48° 50′ 14″ N.	86388·01	86390·54	−2·53	Freycinet.
42	Ditto	48 50 14 —	86388·30	86390·54	−2·24	Sabine (Paris).
43	Ditto	48 50 14 —	86388·56	86390·54	−1·98	Duperrey.
44	Shanklin Farm . . .	50 37 24 —	86396·40	86397·32	−0·92	Kater.
45	Greenwich	51 28 40 —	86398·90	86400·58	−1·68	Foster.
46	Ditto	51 28 40 —	86399·24	86400·58	−1·34	Leutke.
47	Ditto	51 28 40 —	86399·46	86400·58	−1·12	Foster (N. P.)
48	Ditto	51 28 40 —	86400·67	86400·58	+0·09	Sabine (Gr.)
49	Ditto	51 28 40 —	86400·72	86400·58	+0·14	Sabine (Alt.)
50	London	51 31½ 8 —	86399·76	86400·74	−0·98	Fallows.
51	Ditto	51 31 8 —	86399·90	86400·74	−0·84	Foster (N. P.)
52	Ditto	51 31 8 —	86399·72	86400·74	−1·03	Sabine.
53	Ditto	51 31 8 —	86400·00	86400·74	−0·74	Kater.
54	Ditto	51 31 8 —	86400·00	86400·74	−0·74	Goldingham.
55	Ditto	51 31 8 —	86400·00	86400·74	−0·74	Hall.
56	Ditto	51 31 8 —	86400·00	86400·74	−0·74	Brisbane.
57	Ditto	51 31 8 —	86400·00	86400·74	−0·74	Sabine (Paris).
58	Ditto	51 31 8 —	86400·00	86400·74	−0·74	Sabine (Gr.)
59	Ditto	51 31 8 —	86400·00	86400·74	−0·74	Sabine (Alt.)
60	Ditto	51 31 17 —	86400·00	86400·75	−0·75	Foster.
61	Falkland Island . . .	51 31 44 S.	86399·84	86400·78	−0·94	Duperrey.
62	Ditto	51 35 18 —	86396·74	86400·99	−4·25	Freycinet.
63	Arbury Hill	52 12 55 N.	86403·68	86403·35	+0·33	Kater.
64	Petropaulouski . . .	53 0 53 —	86408·90	86406·34	+2·56	Leutke.
65	Clifton	53 27 43 —	86407·48	86407·99	−0·51	Kater.
66	Altona	53 32 45 —	86408·98	86408·28	+0·70	Sabine (Alt.)
67	Staten Island	54 46 23 S.	86415·22	86412·80	+2·42	Foster.
68	Cape Horn	55 51 20 —	86417·98	86416·72	+1·26	Foster.
69	Leith Fort	55 58 41 N.	86418·02	86417·16	+0·86	Kater.
70	Sitka	57 2 58 —	86420·54	86420·96	−0·42	Leutke.
71	Portsoy	57 40 59 —	86424·70	86423·21	+1·49	Kater.
72	Petersburg	59 56 31 —	86432·20	86430·94	+1·26	Leutke.
73	Unst	60 45 28 —	86435·40	86433·64	+1·76	Kater.
74	South Shetland . . .	62 56 11 S.	86444·52	86440·65	+3·87	Foster.
75	Drontheim	63 25 54 N.	86438·64	86442·20	−3·56	Sabine.
76	Hammerfest	70 40 5 —	86461·14	86462·23	−1·09	Sabine.
77	Port Bowen	73 13 39 —	86470·48	86468·06	+2·42	Foster (N. P.)
78	Greenland	74 32 19 —	86470·72	86470·75	−0·03	Sabine.
79	Spitzbergen	79 49 58 —	86483·28	86479·58	+3·70	Sabine.

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The results in this table prove most incontestably the powerful effect of local attraction on the pendulum; since the differences are in many cases much greater than any which would arise from error of observation; and are moreover confirmed, in several instances, by different voyagers. Thus, at Maranham, Ascension and Trinidad, the errors or differences, as found by Captain SABINE and Captain FOSTER, are almost identical: and those at Ascension are further confirmed by Captain DUPERREY. See also the table in page 77. The difference at St. Helena, deduced from Captain FOSTER's experiments, is confirmed by those of Captain LEUTKE. At the Isle of France, the results of the experiments of Captain FREYCINET and Captain DUPERREY, very nearly accord. At Guam, there is indeed a difference in the results between Captain FREYCINET and Captain LEUTKE; but they both indicate an increase of gravity at that place, though differing in degree: it should be noted however that Captain FREYCINET himself had some doubts about the accuracy of the results at Guam; and I think it will appear, from a comparison of the values given by him in page 22 of his *Voyage autour du Monde*, that the pendulum No. 1 exhibits at Guam, a much greater value than it ought to do, as compared with the other two pendulums. At Rio Janeiro, there is a difference in the results between Captain HALL and Captain FREYCINET: but, they both indicate a diminution of gravity at that place. At the Cape of Good Hope also, we find that all the three observers, FOSTER, FREYCINET and FALLOWS, agree in a diminution of gravity; although there is a slight difference in the amount of that diminution. On the other hand it must be confessed that we find discordancies between different observers, which cannot, at present, be satisfactorily explained. Thus at Paramatta and Port Jackson (which, for the purposes of this comparison, may be considered as one station) the results do not accord so well as might be wished. And at the Falkland (or Malouine) Islands, there is a discordancy, between the results of Captain FREYCINET and Captain DUPERREY, that is quite inexplicable. It should be remarked however that Captain FREYCINET made only one experiment, and with only one of the pendulums, at that place: and moreover it will be seen that there is a difference of upwards of $3\frac{1}{2}$ minutes in the latitude of the stations; so that it is possible that the local attraction might not be the same at each place.*

* Captain FREYCINET fixed his observatory, at the Falkland (or Malouine) Islands, in the *Isle of Conti*, situate in the *Baie Française*, now called Berkeley Sound. See his *Voyage autour du Monde*, page 98. But Captain DUPERREY fixed his observatory amidst the ruins of the ancient settlement of *Saint Louis*, at the bottom of the same bay: and states that the difference in the

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On a review of the whole, I think it must be conceded that the differences between the observed and computed values, in many cases, far exceed the probable errors of observation; and being, in several instances, confirmed either by the experiments of various persons, or by various pendulums swung by the same person, show most clearly that there is some local influence on the pendulum, at such stations, with the exact nature of which we are at present unacquainted; and which baffles all our efforts to deduce the true figure of the earth from pendulum experiments, made at a few places only. For, as I have already observed in page 78, the results, deduced from such experiments, will vary according to the selection which we make of the stations: which ought not to occur, if there were no local influence exerted on the pendulum. And I will here take leave to repeat the remark which I have made in a former part of this Report (page 82) that the force of gravity seems to be greater in islands situate at a distance from the main land, than it is on continents. Such islands are, for the most part, of volcanic origin, and consequently formed of dense materials: yet it might be supposed that the circumambient sea would destroy the effect of this superior force exerted on the pendulum.

Either the materials, of which such islands are composed, are more dense than is generally imagined, or the influence of the substratum on the pendulum is confined within very narrow limits. For the elucidation of this point I would suggest that, in case of another scientific expedition towards the north, experiments should be made, not only on the main land, but also *at sea*, on a *field of ice*, beyond the reach of any peculiar local attraction. Another experiment, bearing also on this point, might be made nearer home, and without much expense. Let a vast mass of cannon balls be piled together, at one of the dock-yards, or arsenals (Woolwich for instance); and then let a pendulum be swung at the top of this pile, and at some other station within the yard, beyond the influence of this mass. If any experiments of this kind should be attempted, and indeed in all experimental enquiries of this nature, I should recommend that *two* pendulums, at least, be employed (see the note in page 11): and moreover that, in the case of the pile of balls, the pendulums be swung in the plane of the magnetic meridian, and also perpendicular thereto; in order to ascertain whether any electro-magnetic effect would be produced by such a change of position.

latitude of the two stations is 3′ 32″, and in longitude 3′ 43″: the Isle of Conti being situate to the southward and eastward. See *Con. des Tems* for 1830, page 183. I cannot find any island, designated by this name, in any of the maps of Berkeley Sound. It is probably the same as that which is called *Long Island* in the map of the Geographical Society.

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In the present state however of our knowledge on this subject, it is evident that in deducing the figure of the earth from pendulum experiments, we ought not to reject the results at certain stations, merely because they present a slight anomaly, or do not accord with our preconceived notions respecting the compression. Those experiments only can be legitimately excluded which on the face of them exhibit evident marks of a derangement of the apparatus, or some gross error in the observations.

The most remarkable difference in the general table above given is that which occurs at the Bonin Islands; which amounts to $11\frac{1}{4}$ vibrations.* Captain Beechey, in his account of these islands, states that Peel Island, one of the cluster, "is entirely volcanic, and there is every appearance of the others to the "northward being of the same formation. They have *deep water all around* "*them.*" * * * "We noticed basaltic columns in several parts of Port Lloyd; "and, in one place, Mr. Collie observed them divided into short lengths as at "the Giant's Causeway." * * * "Many of the rocks consisted of tuffaceous basalt, "of a greyish or greenish hue, frequently traversed by veins of petrosilex" (page 233, octavo edition). If substances of this kind (whose specific gravity probably does not amount to 3·0, and the effect of whose influence must be considerably diminished by the inferior density of the surrounding sea) exert such a powerful influence on the pendulum, how are we to estimate the results of experiments made on large continents; and where are we to look for a zero point of comparison for such experiments, undisturbed by any local influence?

The general results of all the experiments, above detailed, indicate the impropriety of fixing on the length of the seconds pendulum, in the present state of our knowledge of that instrument, as a standard measure for any nation or country; unless the precise spot, where it is swung for such purpose, be well defined and always accessible. We see from Captain Foster's experiments at Maranham and Fernando de Noronha, two stations nearly in the same latitude, and not more than 800 miles apart, that the results differ 11·90 vibrations from each other, after the correction is applied for the slight difference of latitude: so that the length of a seconds pendulum deduced from experiments at either of these places, would differ from the length of a similar pendulum deduced from experiments at the other place by more than one hundredth of an inch; a quantity far too great to be tolerated in measures of this kind.

* By Captain Leutke's equations, the difference is only 6·46 vibrations: but he considers even this to be so great a discordance as to warrant the rejection of the result. This however is not a legitimate mode of proceeding: more especially as he acknowledges that the experiments at this place, and at Valparaiso, were the most satisfactory of the whole. See the note in page 79.

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It will be evident, from what has been here stated, that we cannot deduce the true figure of the earth from any experiments (however accurate) made at a *few* places only: but that we must combine the results of numerous stations in various parts of the globe, in order to obtain a correct mean. It has necessarily happened that hitherto all the experiments, with the exception of some of Captain KATER'S, have been made on or near the *sea coast:* and what now seems most desirable, in order to perfect the general theory, would be the acquisition of good experiments made at various places in the *interior of large continents.* Out of the 51 stations enumerated in the list in page 96, there are 46 that are contiguous to the sea coast: and, out of these 46, there are at least one third situate on islands lying at a considerable distance from the main land. At most of these insular stations, the force of gravity (as I have elsewhere remarked) appears to be considerably increased: and it would therefore be desirable to know how far this effect may be modified by the result of experiments at a distance from the ocean.

If we examine the separate results of the five several voyagers, viz. FOSTER, SABINE, FREYCINET, DUPERREY and LEUTKE, we shall find a marked difference between them; inasmuch as the two English voyagers make the compression of the earth about $\frac{1}{289}$, whilst the three Foreign voyagers make it about $\frac{1}{267}$. This, however, will appear more clear from the following short table, showing the value of v (= the number of vibrations at the equator) g (= the increase of gravity) and c= (the reciprocal of the compression), deduced from the results of the experiments of each voyager. To which I have added the combined result of the whole of these and other experiments deduced by myself in the preceding pages; and likewise the general result deduced by Professor AIRY in his excellent and interesting paper, *On the figure of the Earth,* inserted in the *Encyclopedia Metropolitana.* I would here observe, however, that Professor AIRY could not, of course, include the results of the experiments of Captain FOSTER and Captain LEUTKE: but he has retained those made by M.M. BIOT, BESSEL, BORDA and RUMKER, with a *variable* pendulum; which, for the reasons already stated (see page 82), I have omitted.

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Names.	v	g	c	
Leutke	86272·86	·0049150	267·70	= 267·23
Duperrey	86269·60	·0048973	266·40	
Freycinet	86267·36	·0049131	267·60	
Sabine	86263·46	·0051807	288·40	= 288·94
Foster	86264·16	·0051960	289·48	
Baily	86264·86	·0051449	285·26	= 284·08
Airy.	86264·44	·0051330	282·90	

Concluding Remarks.

Should any future expedition be fitted out, for the purpose of making pendulum experiments, I should recommend that at least *two* pendulums be employed. One pendulum only would, by no means, be satisfactory: and, in case of any discordancy between the two, a *third* would become necessary. With respect to the form and construction of such pendulums, I certainly consider that the *bar* pendulum (similar to the iron and copper ones taken out by Captain Foster) is the most convenient for a voyager; as I have already explained (see page 11): and if, like those, it were made convertible, the traveller would, by taking out *two* such pendulums, have the advantage of *four* independent and invariable pendulums.

I would suggest that the agate planes should be very slightly *rounded*, in order that the knife edge should bear only on the middle of the planes; and also that the knife edges themselves should, in like manner, be slightly *rounded*, but at the same time made as straight as possible: great attention should be paid to this part of the apparatus. There should be no play in the Y's: or, if this cannot be conveniently avoided, the experimentalist should always bring the front end of the knife edge close to the front stop of the notch;* in order that the knife edge and agate planes should always touch each other in the same points: and, for a similar purpose, the same face of the pendulum ought always to be turned towards the observer. With these precautions, I think we may reasonably expect to meet with fewer discordancies in any future experiments.

In the packing of these instruments, I should recommend that each pen-

* Or the hind end to the hind notch: for, it is indifferent which mode is practised, provided it be always the same.

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dulum be packed in a separate box; and that no part of the apparatus be packed with it. The pendulum ought not to be packed too tight at the ends: but ample room should be left for the expansion of the metal, and the contraction of the wood. I am the more particular in making these remarks, as I observe that the invariable pendulums, of KATER'S construction, are generally packed up in a box which contains also the agate planes, levels, telescope and frame, thermometers, iron screws and various other articles: thus making a large, heavy and cumbersome box, which renders it liable to accidents amidst the frequent removals which it undergoes at each landing, from the ship to the boat, from the boat to the shore, and afterwards to the station and back again.* I also observe, in the packing of the two KATER'S pendulums taken out by Captain FOSTER, that neither of them has sufficient room to expand; but that the end of each pendulum, next to the knife edge, is obliged to be *forced* into its place, before the lid of the box can be made to shut. This ought to be carefully avoided; otherwise it will cause the thin bar to be permanently *bent:* and the weight of the bob is not sufficiently heavy to render it perfectly straight again when suspended on the agate planes; a fact not sufficiently notorious. The apparatus should always be packed in a separate box.

Should it however still be desirable to retain the essential part of KATER'S construction (that is, instead of a solid bar of uniform thickness, to have a thin pliable plate of metal, with a heavy bob at the end) I would suggest the propriety of removing the tail piece altogether, and of changing the form of the bob from a circular shape to that of a thick parallelogram bevilled at the edges. Such a pendulum could be packed in much less compass, and would consequently be more easy of transportation. It might also, in this case, be packed with its edge uppermost: which would remove the liability to accident which attends the present mode of packing it *flat* in the box. For, on taking it out, with its flat side uppermost it is exposed to the chance of being bent, if (as I have already remarked) it is packed very tight: and great caution and delicacy is always required in handling it. This is not the case with the *bar* pendulums. I would also propose that the knee pieces, to which the knife edge is attached, should be much thicker than they are at present made: also that a hole, about a $\frac{1}{4}$ of an inch in diameter, should be made in the bar, about 3 or 4 inches below the knife edge, for the purpose of passing a short iron rod through it, by which the

* In landing the box containing the pendulum, the sailor is sometimes obliged to carry it on his shoulder *through the rough surf* on the sea coast: it is therefore of importance that it should be as light as possible, that his footing may be the more secure.

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pendulum may be temporarily supported, when we wish to remove it from the agate planes, without wholly dismounting it, for the purpose of adjusting any part of the apparatus: and that a similar hole should be made in the bar, above the knife edge, for the convenience of lifting it safely. I would likewise recommend a diagonal eye piece be affixed to the telescope for greater facility of observation. In fact, all the conveniences of manipulation and observation should be studied and contrived, prior to the final execution of the instrument: and probably many other improvements, besides those here mentioned, might be suggested before any new expedition of the kind in question takes place.

FRANCIS BAILY.

July 17th, 1833.

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APPENDIX,

Containing the following Tables. (See page 20.)

Table I. Comparisons of the Chronometer with the Pendulum Clock.

II. Observed Transits of the Sun and Stars, with the Chronometer.

III. The same reduced to Pendulum Clock Time.

IV. Daily Rate of the Pendulum Clock, deduced therefrom.

V. Details of the several Experiments.

VI. Results of the same.

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APPENDIX.

TABLE I.—Comparisons of Chronometer with Clock.

Monte Video.

1828.	Time.	Chronom. (620).	Clock.	Difference.
		h m s	h m s	h m s
August 25	P.M.	11 13 30	8 34 0	2 39 30
—	——	12 14 30·5	9 35 0	2 39 30·5
—	——	1 4 30·8	10 25 0	2 39 30·8
26	Noon	2 28 37·7	11 49 0	2 39 37·7
—	——	2 49 37·8	12 10 0	2 39 37·8
27	——	2 30 49·7	11 51 0	2 39 49·7
—	——	2 47 49·8	12 8 0	2 39 49·8
—	P.M.	8 24 52·5	5 45 0	2 39 52·5
28	——	3 54 2·5	1 14 0	2 40 2·5
29	Noon	2 52 13·7	12 12 0	2 40 13·7
30	——	2 22 24·9	11 42 0	2 40 24·9
—	——	2 47 25·2	0 7 0	2 40 25·2
—	P.M.	8 16 27·9	5 36 0	2 40 27·9
—	——	8 41 28	6 1 0	2 40 28
—	——	9 45 28·5	7 5 0	2 40 28·5
—	——	11 22 29·1	8 42 0	2 40 29·1
—	——	12 46 30	10 6 0	2 40 30
31	Noon	2 20 37	11 40 0	2 40 37
—	——	2 44 37·2	12 4 0	2 40 37·2
—	P.M.	8 18 40	5 38 0	2 40 40
—	——	10 34 41·1	7 54 0	2 40 41·1
—	——	11 20 41·5	8 40 0	2 40 41·5
—	——	12 8 42	9 28 0	2 40 42
—	——	12 40 42·2	10 0 0	2 40 42·2
September 1	Noon	2 15 49·1	11 35 0	2 40 49·1
—	——	2 43 49·2	0 3 0	2 40 49·2
—	P.M.	8 45 52·2	6 5 0	2 40 52·2
—	——	9 10 52·5	6 30 0	2 40 52·5

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Appendix. Table I.—Monte Video.

1828.	Time.	Chronom. (620).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
September 1	P.M.	9	39	52·7	6	59	0	2	40	52·7
—	——	10	12	53	7	32	0	2	40	53
—	——	11	13	53·5	8	33	0	2	40	53·5
—	——	12	12	54	9	32	0	2	40	54
—	——	12	37	54·2	9	57	0	2	40	54·2
2	——	10	7	5	7	26	0	2	41	5
—	——	11	8	5·5	8	27	0	2	41	5·5
—	——	12	8	6	9	27	0	2	41	6
—	——	1	8	6·5	10	27	0	2	41	6·5
3	Noon	2	13	13	11	32	0	2	41	13
—	——	2	41	13·1	12	0	0	2	41	13·1
—	P.M.	8	33	16	5	52	0	2	41	16
—	——	9	35	16·5	6	54	0	2	41	16·5
—	——	10	38	17	7	57	0	2	41	17
—	——	11	40	17·5	8	59	0	2	41	17·5
—	——	11	55	17·6	9	14	0	2	41	17·6
4	Noon	3	2	25·4	0	21	0	2	41	25·4
—	P.M.	8	25	28	5	44	0	2	41	28
—	——	9	27	28·5	6	46	0	2	41	28·5
—	——	10	30	29	7	49	0	2	41	29
—	——	11	31	29·5	8	50	0	2	41	29·5
—	——	12	33	30	9	52	0	2	41	30
5	Noon	2	40	36·8	11	59	0	2	41	36·8
—	P.M.	8	36	39·5	5	55	0	2	41	39·5
—	——	9	38	40	6	57	0	2	41	40
—	——	10	41	40·5	8	0	0	2	41	40·5
—	——	11	44	41	9	3	0	2	41	41
—	——	12	43	41·5	10	2	0	2	41	41·5
6	Noon	2	44	48·2	12	3	0	2	41	48·2
—	P.M.	8	38	51	5	57	0	2	41	51
—	——	10	42	52	7	1	0	2	41	52
—	——	11	52	52·5	9	11	0	2	41	52·5
—	——	12	10	52·6	9	29	0	2	41	52·6
7	——	8	37	2·5	5	55	0	2	42	2·5

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APPENDIX. TABLE I.—Monte Video.

1828.	Time.	Chronom. (620).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
September 7	P.M.	10	38	3·5	7	57	0	2	42	3·5
—	——	11	40	4	8	58	0	2	42	4
					Staten Island.					
November 3	Noon	1	59	36·2	11	48	0	2	11	36·2
—	——	2	29	35	12	18	0	2	11	35
—	P.M.	10	31	11·5	8	20	0	2	11	11·5
—	——	11	1	10	8	50	0	2	11	10
—	——	12	2	7	9	51	0	2	11	7
—	——	1	3	5	10	52	0	2	11	5
4	Noon	2	7	25·5	11	57	0	2	10	25·5
—	——	2	37	24	0	27	0	2	10	24
—	P.M.	9	59	2·5	7	49	0	2	10	2·5
5	Noon	2	4	15·5	11	55	0	2	9	15·5
—	——	2	26	14·5	0	17	0	2	9	14·5
—	P.M.	9	27	51	7	19	0	2	8	51
6	Noon	1	59	5·5	11	51	0	2	8	5·5
—	——	2	20	4·5	0	12	0	2	8	4·5
—	P.M.	10	21	41	8	14	0	2	7	41
7	Noon	2	4	55	11	58	0	2	6	55
		Gale of wind from			W.S.W. with much			rain.		
8	Noon	2	20	44	12	15	0	2	5	44
—	P.M.	9	20	23·5	7	15	0	2	5	23·5
9	Noon	2	29	33·5	12	25	0	2	4	33·5
—	P.M.	9	50	12	7	46	0	2	4	12
10	A.M.	10	10	36	8	7	0	2	3	36
—	——	10	49	34	8	46	0	2	3	34
—	Noon	1	55	25	11	52	0	2	3	25
—	——	2	16	24	0	13	0	2	3	24
—	P.M.	5	34	14·5	3	31	0	2	3	14·5
—	——	6	3	13	4	0	0	2	3	13
—	——	9	21	3	7	28	0	2	3	3
—	——	10	22	0·5	8	19	0	2	3	0·5

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Appendix. Table I.—Staten Island.

1828.	Time.	Chronom. (620).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
November 10	P.M.	11	23	57·5	9	21	0	2	2	57·5
—	——	12	25	54·5	10	23	0	2	2	54·5
—	——	12	55	53	10	53	0	2	2	53
11	A.M.	10	18	25·5	8	16	0	2	2	25·5
—	——	10	48	24	8	46	0	2	2	24
—	Noon	2	47	12·5	0	45	0	2	2	12·5
—	P.M.	5	31	4·5	3	29	0	2	2	4·5
—	——	6	2	3	4	0	0	2	2	3
—	——	9	39	52·5	7	38	0	2	1	52·5
—	——	10	1	51·5	8	0	0	2	1	51·5
12	Noon	2	3	5.6	0	2	0	2	1	5·6
—	——	2	19	4	0	18	0	2	1	4
—	P.M.	9	41	42·5	7	41	0	2	0	42·5
—	——	9	51	42	7	51	0	2	0	42
—	——	11	14	38	9	14	0	2	0	38
—	——	11	44	36·5	9	44	0	2	0	36·5
—	——	12	25	34·5	10	25	0	2	0	34·5
—	——	12	46	33·5	10	46	0	2	0	33·5
13	Noon	1	59	55	0	0	0	1	59	55
—	——	2	19	54	0	20	0	1	59	54
—	P.M.	9	11	34	7	12	0	1	59	34
—	——	9	52	32	7	53	0	1	59	32
—	——	11	13	28	9	14	0	1	59	28
—	——	12	5	25·5	10	6	0	1	59	25·5
—	——	12	36	24	10	37	0	1	59	24
14	Noon	2	12	44·5	0	14	0	1	58	44·5
—	P.M.	9	25	23·5	7	27	0	1	58	23·5
—	——	9	45	22·5	7	47	0	1	58	22·5
15	Noon	2	12	34·5	0	15	0	1	57	34·5
—	P.M.	9	45	12·5	7	48	0	1	57	12·5
—	——	10	36	10	8	39	0	1	57	10
—	——	10	58	9	9	1	0	1	57	9
—	——	11	28	7·5	9	31	0	1	57	7·5
—	——	12	8	5·5	10	11	0	1	57	5·5

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APPENDIX. TABLE I.—Staten Island.

1828.	Time.	Chronom. (620).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
November 15	P.M.	12	38	4	10	41	0	1	57	4
16	Noon	14	6	24·5	12	10	0	1	56	24·5
—	P.M.	12	1	55·5	10	6	0	1	55	55·5
—	——	12	31	54	10	36	0	1	55	54
17	Noon	1	53	14·5	11	58	0	1	55	14·5
—	——	2	23	13	0	28	0	1	55	13
—	P.M.	9	12	53	7	18	0	1	54	53
—	——	9	32	52	7	38	0	1	54	52
—	——	10	12	50	8	18	0	1	54	50
18	Noon	2	19	2·5	0	25	0	1	54	2·5
20	——	2	15	42	0	24	0	1	51	42
—	P.M.	8	44	23	6	53	0	1	51	23
—	——	9	14	21·5	7	23	0	1	51	21·5
21	Noon	1	54	32·5	0	4	0	1	50	32·5
—	P.M.	9	2	11·5	7	12	0	1	50	11·5
—	——	9	12	11	7	22	0	1	50	11
—	——	10	34	7	8	44	0	1	50	7
—	——	10	55	6	9	5	0	1	50	6
—	——	11	26	4·5	9	36	0	1	50	4·5
—	——	12	6	2·5	10	16	0	1	50	2·5
—	——	2	8	56·5	12	19	0	1	49	56·5
22	Noon	1	54	22	0	5	2	1	49	22
—	——	2	14	21	0	25	0	1	49	21
23	——	1	57	11·5	0	9	0	1	48	11·5
—	——	2	18	10·5	0	30	0	1	48	10·5
—	P.M.	8	49	51·5	7	2	0	1	47	51·5
—	——	10	52	45·5	9	5	0	1	47	45·5
—	——	11	12	44·5	9	25	0	1	47	44·5
—	——	11	53	42·5	10	6	0	1	47	42·5
—	——	12	53	39·5	11	6	0	1	47	39·5
—	——	2	5	36	0	18	0	1	47	36
24	Noon	1	53	1·5	0	6	0	1	47	1·5
—	——	2	14	0·5	0	27	0	1	47	0·5
25	——	2	16	50	0	31	0	1	45	50

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Appendix. Table I.—Staten Island.

1828.	Time.	Chronom. (620).	Clock.	Difference.
		h m s	h m s	h m s
November 26	Noon	1 55 40·5	0 11 0	1 44 40·5
—	——	2 15 39·5	0 31 0	1 44 39·5
—	P.M.	8 36 21	6 52 0	1 44 21
—	——	9 6 19·5	7 22 0	1 44 19·5
—	——	10 28 15·5	8 44 0	1 44 15·5
—	——	10 49 14·5	9 5 0	1 44 14·5
—	——	11 39 12	9 55 0	1 44 12
—	——	12 20 10	10 36 0	1 44 10
—	——	12 50 8·5	11 6 0	1 44 8·5
—	——	1 52 5·5	0 8 0	1 44 5·5
27	Noon	1 57 30	0 14 0	1 43 30
—	P.M.	11 2 3·5	9 19 0	1 43 3·5
Commencement of		Pendulum Experiments with Copper		Pendulum.
29	P.M.	8 35 23·5	3 37 0	4 58 23·5
—	——	10 8 21·5	5 10 0	4 58 21·5
—	——	10 29 21	5 31 0	4 58 21
—	——	11 12 20	6 14 0	4 58 20
—	——	11 58 19	7 0 0	4 58 19
30	Noon	2 24 0·5	9 27 0	4 57 0·5
Clock	stopped for	$21^m\ 11^s{\cdot}27$, the proper comparison will		therefore be
30	P.M.	10 54 56	2 36 0	3 41 4
December 1	Noon	1 27 38	5 9 0	3 41 22 *
—	——	2 12 36	5 54 0	3 41 24
		Final commencement.		
—	P.M.	11 52 38·5	3 14 0	3 21 21·5
—	——	12 9 36·5	3 31 0	3 21 23·5
—	——	12 31 34	3 53 0	3 21 26
—	——	12 47 32	4 9 0	3 21 28
—	——	1 13 29	4 35 0	3 21 31
—	——	1 25 27·5	4 47 0	3 21 32·5
2	Noon	1 58 58	5 22 0	3 23 2
—	——	2 10 56·5	5 34 0	3 23 3·5
—	P.M.	11 15 52	2 40 0	3 24 8
3	Noon	1 50 8	5 16 0	3 25 52

* $3^h\ 20^m\ 11^s{\cdot}73$.

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Appendix. Table I.—Staten Island.

1828.	Time.	Chronom. (620).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
December 3	Noon	2	11	5·5	5	37	0	3	25	54·5
—	P.M.	10	8	9	1	35	0	3	26	51
—	——	10	42	5	2	9	0	3	26	55
—	——	11	12	1·5	2	39	0	3	26	58·5
—	——	11	57	56	3	25	0	3	27	4
—	——	12	52	49·5	4	20	0	3	27	10·5
—	——	1	17	46·5	4	45	0	3	27	13·5
4	Noon	2	11	14·5	5	40	0	3	28	45·5
—	P.M.	10	14	17	1	44	0	3	29	43
5	Noon	1	54	25	5	26	0	3	31	35
—	——	2	11	23	5	43	0	3	31	37
—	P.M.	9	35	30·5	1	8	0	3	32	29·5
—	——	10	0	27·5	1	33	0	3	32	32·5
6	Noon	1	55	34	5	30	0	3	34	26
—	——	2	8	32·5	5	43	0	3	34	27·5
—	P.M.	9	57	37	1	33	0	3	35	23
7	Noon	1	50	44	5	28	0	3	37	16
—	——	2	10	41·5	5	48	0	3	37	18·5
8	——	2	8	51	5	49	0	3	40	9
9	——	1	48	2	5	31	0	3	42	58
—	——	2	10	59	5	54	0	3	43	1
—	P.M.	9	7	10	12	51	0	3	43	50
—	——	9	37	6·5	1	21	0	3	43	53·5
—	——	10	43	58·5	2	28	0	3	44	1·5
—	——	11	22	54	3	7	0	3	44	6
—	——	11	56	50	3	41	0	3	44	10
—	——	12	34	45·5	4	19	0	3	44	14·5
—	——	12	50	43·5	4	35	0	3	44	16·5
10	Noon	1	48	11·5	5	34	0	3	45	48·5
—	——	2	12	8·5	5	58	0	3	45	51·5
11	——	1	51	21	5	40	0	3	48	39
—	——	2	12	18·5	6	1	0	3	48	41·5
—	P.M.	9	17	28·5	1	7	0	3	49	31·5
—	——	11	46	11	4	36	0	3	49	49

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Appendix. Table I.—Staten Island.

1828.	Time.	Chronom. (620).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
December 12	Noon	2	21	27·5	6	13	0	3	51	32·5
—	P.M.	10	1	33	1	54	0	3	52	27
—	——	11	38	21·5	2	31	0	3	52	38·5
—	——	11	59	19	2	52	0	3	52	41
—	——	12	37	14·5	4	30	0	3	52	45·5
13	Noon	1	48	40·5	5	43	0	3	54	19·5
—	——	2	10	38	6	5	0	3	54	22
—	P.M.	9	17	47·5	1	13	0	3	55	12·5
—	——	10	25	39·5	2	21	0	3	55	20·5
—	——	11	33	31·5	3	29	0	3	55	28·5
—	——	0	15	26·5	4	11	0	3	55	33·5
—	——	0	36	24	4	32	0	3	55	36
14	Noon	1	54	49·5	5	52	0	3	57	10·5
—	——	2	11	47·5	6	9	0	3	57	12·5
—	P.M.	9	2	59	1	1	0	3	58	1
—	——	11	34	41	3	33	0	3	58	19
—	——	11	51	39	3	50	0	3	58	21
—	——	12	12	36·5	4	11	0	3	58	23·5
—	——	12	29	34·5	4	28	0	3	58	25·5
15	Noon	1	48	59·5	5	49	0	4	0	0·5
—	——	2	9	57	6	10	0	4	0	3
—	P.M.	9	54	32	1	55	30	4	0	58
—	——	10	14	59·5	2	16	0	4	1	0·5
—	——	11	5	53·5	3	7	0	4	1	6·5
—	——	11	44	19	3	45	30	4	1	11
—	——	12	9	46	4	11	0	4	1	14
—	——	12	25	44	4	27	0	4	1	16
				South Shetland.						
1829.										
January 17	P.M.	10	33	25·5	9	21	0	1	12	25·5
—	——	11	37	20·5	10	25	0	1	12	20·5
—	——	12	35	16	11	23	0	1	12	16
18	A.M.	10	11	31	9	0	0	1	11	31

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Appendix. Table I.—South Shetland.

1829.	Time.	Chronom. (620).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
January 18	A.M.	10	55	27·5	9	44	0	1	11	27·5
—	Noon	1	29	15·5	0	18	0	1	11	15·5
—	——	2	1	13	0	50	0	1	11	13
—	P.M.	7	48	46	6	38	0	1	10	46
19	Noon	1	49	21·5	0	40	0	1	9	21·5
20	——	1	54	28·5	0	47	0	1	7	28·5
—	P.M.	11	10	45	10	4	0	1	6	45
21	Noon	1	36	37	0	31	0	1	5	37
—	P.M.	11	42	49·5	10	38	0	1	4	49·5
22	Noon	1	38	44	0	35	0	1	3	44
—	P.M.	10	10	4	9	7	0	1	3	4
23	A.M.	7	58	18	6	56	0	1	2	18
—	Noon	1	34	51·5	0	33	0	1	1	51·5
—	——	1	53	20	0	51	30	1	1	50
—	P.M.	10	42	8·5	9	41	0	1	1	8·5
24	A.M.	9	37	17	8	37	0	1	0	17
—	Noon	1	32	58·5	0	33	0	0	59	58·5
—	P.M.	9	25	21·5	8	26	0	0	59	21·5
25	A.M.	9	9	26·5	8	11	0	0	58	26·5
—	Noon	1	57	34	0	59	30	0	58	4
—	P.M.	10	55	52	9	58	30	0	57	22
26	A.M.	8	43	6	7	46	30	0	56	36
—	Noon	1	28	13·5	0	32	0	0	56	13·5
—	——	1	59	11	1	3	0	0	56	11
—	P.M.	8	48	39	7	53	0	0	55	39
27	A.M.	8	50	42·5	7	56	0	0	54	42·5
—	Noon	1	49	19	0	55	0	0	54	19
—	P.M.	9	4	45	8	11	0	0	53	45
28	A.M.	8	47	50	7	55	0	0	52	50
—	Noon	1	46	26·5	0	54	0	0	52	26·5
—	P.M.	9	51	48·5	9	0	0	0	51	48·5
—	——	10	23	46	9	32	0	0	51	46
—	——	10	49	44	9	58	0	0	51	44
29	A.M.	8	55	56·5	8	5	0	0	50	56·5

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Appendix. Table I.—South Shetland.

1829.	Time.	Chronom. (620).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
January 29	A.M.	11	28	14·5	10	37	30	0	50	44·5
—	Noon	1	29	35	0	39	0	0	50	35
—	——	1	54	33	1	4	0	0	50	33
—	P.M.	8	51	0·5	8	1	0	0	50	0·5
30	A.M.	8	59	3·5	8	10	0	0	49	3·5
—	Noon	1	44	41	0	56	0	0	48	41
—	P.M.	9	4	6·5	8	16	0	0	48	6·5
31	A.M.	9	6	10	8	19	0	0	47	10
—	Noon	1	19	50	0	33	0	0	46	50
—	——	1	45	48	0	59	0	0	46	48
—	P.M.	10	22	7·5	9	36	0	0	46	7·5
February 1	A.M.	9	5	17	8	20	0	0	45	17
—	Noon	1	23	56·5	0	39	0	0	44	56·5
—	——	2	7	53	0	23	0	0	44	53
—	P.M.	8	43	22	7	59	0	0	44	22
—	——	9	34	18	8	50	0	0	44	18
—	——	10	32	13·5	9	48	0	0	44	13·5
—	——	11	22	39·5	10	38	30	0	44	9·5
—	——	12	25	4·5	11	41	0	0	44	4·5
—	——	2	6	56·5	1	23	0	0	43	56·5
2	A.M.	9	17	52·5	8	34	30	0	43	22·5
—	Noon	1	24	3	0	41	0	0	43	3
—	——	2	1	0	1	18	0	0	43	0
—	P.M.	8	22	30	7	40	0	0	42	30
3	A.M.	9	49	56·5	9	8	30	0	41	26·5
—	Noon	1	23	9·5	0	42	0	0	41	9·5
—	P.M.	1	48	7·5	1	7	0	0	41	7·5
—	——	8	48	34	8	8	0	0	40	34
4	A.M.	9	46	31·5	9	7	0	0	39	31·5
—	Noon	1	31	13·5	0	52	0	0	39	13·5
—	——	1	49	12	1	10	0	0	39	12
—	P.M.	8	38	39·5	8	0	0	0	38	39·5
—	——	9	41	34·5	9	3	0	0	38	34·5
—	——	10	18	31·5	9	40	0	0	38	31·5

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Appendix. Table I.—South Shetland.

1829.	Time.	Chronom. (620).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
February 4	P.M.	11	15	27	10	37	0	0	38	27
—	——	12	5	23	11	27	0	0	38	23
—	——	1	58	14	1	20	0	0	38	14
5	A.M.	9	20	38·5	8	43	0	0	37	38·5
—	Noon	1	18	19·5	0	41	0	0	37	19·5
—	——	2	8	15·5	1	31	0	0	37	15·5
—	P.M.	8	14	46·5	7	38	0	0	36	46·5
—	——	9	36	40	9	0	0	0	36	40
—	——	10	13	37	9	37	0	0	36	37
—	——	11	4	33	10	28	0	0	36	33
—	——	12	7	28	11	31	0	0	36	28
—	——	1	48	20	1	12	0	0	36	20
6	A.M.	9	27	43·5	8	52	0	0	35	43·5
—	——	1	18	25	0	43	0	0	35	25
—	Noon	1	49	22·5	1	14	0	0	35	22·5
—	P.M.	8	19	51·5	7	45	0	0	34	51·5
7	A.M.	9	17	20	8	43	30	0	33	50
—	Noon	1	23	0·5	0	49	30	0	33	30·5
—	——	2	0	57·5	1	27	30	0	33	27·5
—	P.M.	8	59	54·5	8	27	0	0	32	54·5
—	——	9	30	52	8	58	0	0	32	52
—	——	10	2	49·5	9	30	0	0	32	49·5
—	——	10	59	45	10	27	0	0	32	45
—	——	11	50	41	11	18	0	0	32	41
—	——	1	38	32·5	1	6	0	0	32	32·5
Commencement of Experiments with convertible Pendulums.										
9	Noon	1	15	17·5	10	51	0	2	24	17·5
—	——	1	56	12	11	32	0	2	24	12
—	P.M.	9	1	15	6	38	0	2	23	15
10	A.M.	9	4	37·5	6	43	0	2	21	37·5
—	Noon	13	42	30	11	21	30	2	21	0
—	P.M.	8	46	3	6	26	0	2	20	3
11	A.M.	8	37	27	6	19	0	2	18	27
—	Noon	1	40	46	11	23	0	2	17	46

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Appendix. Table I.—South Shetland.

1829.	Time.	Chronom. (620).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
February 11	P.M.	9	5	46	6	49	0	2	16	46
12	A.M.	9	4	9	6	49	0	2	15	9
—	Noon	1	23	34	11	9	0	2	14	34
—	——	1	41	31·5	11	27	0	2	14	31·5
—	P.M.	9	7	31·5	6	55	0	2	12	31·5
13	A.M.	9	23	52	7	12	0	2	11	52
—	Noon	1	41	47	11	30	30	2	11	17
—	P.M.	8	30	22	6	20	0	2	10	22
—	——	9	0	18	6	50	0	2	10	18
—	——	9	37	13	7	27	0	2	10	13
14	A.M.	8	58	41	6	50	0	2	8	41
—	Noon	13	31	34	11	23	30	2	8	4
—	P.M.	8	47	35	6	40	30	2	7	5
15	A.M.	9	4	55	6	59	30	2	5	25
—	Noon	13	37	48	11	33	0	2	4	48
—	P.M.	8	31	52	6	28	0	2	3	52
16	A.M.	9	14	39	7	12	30	2	2	9
—	Noon	1	14	36·5	11	13	0	2	1	36·5
—	——	1	36	33·5	11	35	0	2	1	33·5
—	P.M.	8	31	37·5	6	31	0	2	0	37·5
17	A.M.	8	49	57·5	6	51	0	1	58	57·5
—	Noon	1	18	21	11	20	0	1	58	21
—	——	1	40	18	11	42	0	1	58	18
—	P.M.	8	33	52	6	36	30	1	57	22
18	A.M.	9	2	40·5	7	7	0	1	55	40·5
—	Noon	1	28	4·5	11	33	0	1	55	4·5
—	P.M.	10	22	52	8	29	0	1	53	52
19	A.M.	9	1	25·5	7	9	0	1	52	25·5
—	——	9	31	21·5	7	39	0	1	52	21·5
—	Noon	1	38	18	11	46	30	1	51	48
—	P.M.	9	53	11	8	2	30	1	50	41
20	A.M.	9	40	5	7	51	0	1	49	5
—	——	10	16	30	8	27	30	1	49	0
—	Noon	1	34	3	11	45	30	1	48	33

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APPENDIX. TABLE I.—South Shetland.

1829.	Time.	Chronom. (620). h m s	Clock. h m s	Difference. h m s
February 20	P.M.	9 40 56·5	7 53 30	1 47 26·5
21	A.M.	9 29 20	7 43 30	1 45 50
—	Noon	13 16 49	11 31 30	1 45 19
—	——	13 34 46·5	11 49 30	1 45 16·5
—	P.M.	9 15 14	7 31 0	1 44 14
22	A.M.	8 46 40	7 4 0	1 42 40
—	Noon	1 18 3	11 36 0	1 42 3
—	——	1 37 0·5	11 55 0	1 42 0·5
—	P.M.	9 17 28	7 36 30	1 40 58
23	A.M.	8 51 24	7 12 0	1 39 24
—	Noon	1 5 49·5	11 27 0	1 38 49·5
—	——	1 31 16	11 52 30	1 38 46
—	P.M.	10 31 3	8 53 30	1 37 33
24	A.M.	9 3 7	7 27 0	1 36 7
—	Noon	1 34 0	11 58 30	1 35 30
—	P.M.	10 4 50·5	8 30 30	1 34 20·5
25	A.M.	8 46 23	7 13 30	1 32 53
—	Noon	1 6 17·5	11 34 0	1 32 17·5
—	——	1 32 14	0 0 0	1 32 14
—	P.M.	10 37 30	9 6 30	1 31 0
26	A.M.	9 39 0·5	8 9 30	1 29 30·5
		Cape Horn.		
April 14	A.M.	9 41 9·5	8 25 0	1 16 9·5
—	Noon	1 25 27	0 9 30	1 15 57
—	P.M.	10 39 26·5	9 24 0	1 15 26·5
15	A.M.	9 36 50	8 22 0	1 14 50
—	Noon	1 21 37·5	0 7 0	1 14 37·5
—	P.M.	7 52 16	6 38 0	1 14 16
16	A.M.	9 37 30·5	8 24 0	1 13 30·5
—	Noon	12 55 19·5	11 42 0	1 13 19·5
—	——	1 22 18	0 9 0	1 13 18
The Clock	was stopped this Afternoon to		readjust Pendulum	of Experiment.

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Appendix. Table I.—Cape Horn.

1829.	Time.	Chronom. (620).	Clock.	Difference.
		h m s	h m s	h m s
April 16	P.M.	5 41 40	4 18 0	1 23 40
—	——	9 19 28	7 56 0	1 23 28
—	——	11 53 19·5	10 30 0	1 23 19·5
17	A.M.	9 24 47·5	8 2 0	1 22 47·5
—	Noon	1 17 34·5	11 55 0	1 22 34·5
—	P.M.	12 47 56	11 26 0	1 21 56
		Experiments commence here.		
19	A.M.	9 38 6	8 18 0	1 20 6
—	Noon	0 44 55·5	11 25 0	1 19 55·5
—	——	1 29 53	0 10 0	1 19 53
—	P.M.	6 12 37·5	4 53 0	1 19 37·5
—	——	7 42 32·5	6 23 0	1 19 32·5
—	——	8 46 29	7 27 0	1 19 29
—	——	9 51 25·5	8 32 0	1 19 25·5
—	——	10 54 22	9 35 0	1 19 22
—	——	11 40 19·5	10 21 0	1 19 19·5
—	——	12 44 16	11 25 0	1 19 16
20	A.M.	2 14 11	0 55 0	1 19 11
—	——	8 49 49	7 31 0	1 18 49
—	Noon	1 8 34·5	11 50 0	1 18 34·5
—	P.M.	5 19 20·5	4 1 0	1 18 20·5
21	A.M.	9 17 28	8 0 0	1 17 28
—	Noon	12 53 16	11 36 0	1 17 16
—	——	1 20 14·5	0 3 0	1 17 14·5
—	P.M.	5 5 2	3 48 0	1 17 2
—	——	5 59 59	4 43 0	1 16 59
—	——	7 21 24·5	6 4 30	1 16 54·5
—	——	10 40 43·5	9 24 0	1 16 43·5
—	——	11 26 41	10 10 0	1 16 41
—	——	12 30 37·5	11 14 0	1 16 37·5
22	A.M.	8 55 10	7 39 0	1 16 10
—	Noon	1 17 55·5	0 2 0	1 15 55·5
—	P.M.	6 14 39	4 59 0	1 15 39
—	——	8 31 31·5	7 16 0	1 15 31·5

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Appendix. Table I.—Cape Horn.

1829.	Time.	Chronom. (620).	Clock.	Difference.
		h m s	h m s	h m s
April 22	P.M.	9 35 28	8 20 0	1 15 28
—	——	10 30 25	9 15 0	1 15 25
—	——	11 24 22	10 9 0	1 15 22
—	——	12 29 18·5	11 14 0	1 15 18·5
23	A.M.	8 49 51	7 35 0	1 14 51
—	Noon	12 54 37·5	11 40 0	1 14 37·5
—	——	13 12 36·5	11 58 0	1 14 36·5
—	P.M.	5 35 22	4 21 0	1 14 22
—	——	9 13 10	7 59 0	1 14 10
—	——	10 36 5·5	9 22 0	1 14 5·5
—	——	11 39 2	10 25 0	1 14 2
—	——	12 24 59·5	11 11 0	1 13 59·5
24	A.M.	6 5 40·5	4 52 0	1 13 40·5
—	——	9 6 30·5	7 53 0	1 13 30·5
—	Noon	12 49 18	11 36 0	1 13 18
—	——	1 16 16·5	0 3 0	1 13 16·5
—	P.M.	5 29 2·5	4 16 0	1 13 2·5
—	——	8 21 53	7 9 0	1 12 53
—	——	12 19 40	11 7 0	1 12 40
25	A.M.	8 56 11·5	7 44 0	1 12 11·5
—	Noon	13 5 57·5	11 54 0	1 11 57·5
—	P.M.	5 36 42·5	4 25 0	1 11 42·5
—	——	9 22 30	8 11 0	1 11 30
—	——	10 26 26·5	9 15 0	1 11 26·5
—	——	12 15 20·5	11 4 0	1 11 20·5
Wound up	the Clock a little before the following comparison, and found it to have lost 1ˢ·5 during the operation.			
26	A.M.	9 19 52	8 9 0	1 10 52
—	——	9 27 51·5	8 17 0	1 10 51·5
—	Noon	12 55 40	11 45 0	1 10 40
—	——	1 13 39	0 3 0	1 10 39
—	P.M.	0 45 1	11 35 0	1 10 1
27	A.M.	8 58 33·5	7 49 0	1 9 33·5
—	Noon	1 12 19·5	0 3 0	1 9 19·5

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Appendix. Table I.—Cape Horn.

1829.	Time.	Chronom. (620).	Clock.	Difference.
		h m s	h m s	h m s
April 27	P.M.	5 26 5·5	4 17 0	1 9 5·5
—	——	8 11 56·5	7 3 0	1 8 56·5
—	——	10 9 50	9 1 0	1 8 50
—	——	11 4 47	9 56 0	1 8 47
—	——	12 8 43·5	11 0 0	1 8 43·5
	Conclusion of Experiments with No. XI. Pendulum.			
28	A.M.	9 32 12	8 24 0	1 8 12
—	P.M.	7 48 38	6 41 0	1 7 38
—	——	12 2 24	10 55 0	1 7 24
29	A.M.	8 55 54·5	7 49 0	1 6 54·5
—	Noon	1 15 40	0 9 0	1 6 40
—	P.M.	5 30 26	4 24 0	1 6 26
—	——	12 1 4·5	10 55 0	1 6 4·5
30	A.M.	10 2 31·5	8 57 0	1 5 31·5
—	Noon	1 13 21	0 8 0	1 5 21
—	P.M.	9 49 52·5	8 45 0	1 4 52·5
May 1	A.M.	9 32 13·5	8 28 0	1 4 13·5
—	Noon	1 7 1·5	0 3 0	1 4 1·5
—	P.M.	6 31 43·5	5 28 0	1 3 43·5
—	——	10 1 32	8 58 0	1 3 32
—	——	11 13 28	10 10 0	1 3 28
2	A.M.	9 43 53	8 41 0	1 2 53
—	Noon	1 10 41·5	0 8 0	1 2 41·5
—	P.M.	11 57 5·5	10 55 0	1 2 5·5
3	A.M.	9 35 33·5	8 34 0	1 1 33·5
—	Noon	1 40 20	0 39 0	1 1 20
—	P.M.	8 36 57	7 36 0	1 0 57
—	——	9 50 53	3 50 0	1 0 53
—	——	11 40 47	10 40 0	1 0 47
4	A.M.	10 6 12	9 6 0	1 0 12
—	Noon	1 22 1	0 22 0	1 0 1
—	P.M.	7 27 40·5	6 28 0	0 59 40·5
—	——	8 21 37·5	7 22 0	0 59 37·5
—	——	9 43 33	8 44 0	0 59 33

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APPENDIX. TABLE I.—Cape Horn.

1829.	Time.	Chronom. (620).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
May 4	P.M.	10	28	30	9	29	0	0	59	30
—	——	11	14	28	10	15	0	0	59	28
5	A.M.	9	52	52·5	8	54	0	0	58	52·5
—	Noon	1	34	40	0	36	0	0	58	40
—	P.M.	7	16	21	6	18	0	0	58	21
6	A.M.	9	13	35	8	16	0	0	57	35
—	Noon	1	18	21·5	0	21	0	0	57	21·5
—	P.M.	4	29	11	3	32	0	0	57	11
—	——	12	18	45	11	22	0	0	56	45
7	A.M.	9	25	14·5	8	29	0	0	56	14·5
—	Noon	1	16	1·5	0	20	0	0	56	1·5
—	P.M.	4	58	49	4	3	0	0	55	49
—	——	11	7	28·5	10	12	0	0	55	28·5
8	A.M.	9	15	54·5	8	21	0	0	54	54·5
—	Noon	0	57	42	0	3	0	0	54	42
—	P.M.	4	34	30	3	40	0	0	54	30
9	A.M.	9	31	33·5	8	38	0	0	53	33·5
—	Noon	1	6	21·5	0	13	0	0	53	21·5
—	P.M.	9	33	53·5	8	41	0	0	52	53·5
10	A.M.	Wound up the Clock and observed the seconds' hand eventually to let slip one vibration of the Pendulum, but lost 5ˢ.								
—	——	10	2	12·5	9	10	0	0	52	12·5 *
—	——	10	11	16	9	19	0	0	52	16 †
—	Noon	1	48	4	0	56	0	0	52	4
11	——	2	22	42	1	32	0	0	50	42
14	A.M.	9	49	30	9	2	30	0	47	0
After this computation took down the apparatus, as the weather was, and had been, such as to preclude the necessary observations for the rates of the Clock being obtained.										

* Before winding
† After winding
} So that there is a deficiency of 5ˢ at the usual rate of difference in computation.

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Appendix. Table I.—Cape of Good Hope.

1829.	Time.	Chronom. (902).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
August 6	Noon	12	10	8·5	11	10	0	1	0	8·5
7	P.M.	6	17	35·5	5	16	0	1	1	35·5
—	——	8	43	42·5	7	42	0	1	1	42·5
—	——	8	54	43	7	53	0	1	1	43
—	——	10	15	47	9	14	0	1	1	47
—	——	11	56	52	10	55	0	1	1	52
8	Noon	12	31	28·5	11	29	0	1	2	28·5
—	P.M.	6	29	45·5	5	27	0	1	2	45·5
—	——	7	9	47·5	6	7	0	1	2	47·5
—	——	7	50	49·5	6	48	0	1	2	49·5
—	——	8	53	52·5	7	51	0	1	2	52·5
—	——	10	26	57	9	24	0	1	2	57
—	——	11	49	1	10	46	0	1	3	1
9	Noon	12	1	36	10	58	0	1	3	36
—	——	12	23	37	10	20	0	1	3	37
—	P.M.	6	51	55·5	5	48	0	1	3	55·5
—	——	7	14	29·5	6	10	30	1	3	59·5
—	——	8	45	1	7	41	0	1	4	1
—	——	10	19	5·5	9	15	0	1	4	5·5
—	——	11	41	9·5	10	37	0	1	4	9·5
10	P.M.	6	57	4·5	5	52	0	1	5	4·5
—	——	8	9	8	7	4	0	1	5	8
—	——	8	39	9·5	7	34	0	1	5	9·5
—	——	8	48	10	7	43	0	1	5	10
—	——	10	0	13·5	8	55	0	1	5	13·5
—	——	11	42	18·5	10	37	0	1	5	18·5
11	Noon	12	21	55	11	16	0	1	5	55
—	——	12	41	56	11	36	0	1	5	56
—	P.M.	7	0	14	5	54	0	1	6	14
—	——	8	2	17	6	56	0	1	6	17
—	——	8	43	19	7	37	0	1	6	19
—	——	10	15	23·5	9	9	0	1	6	23·5
12	Noon	11	48	2·5	10	41	0	1	7	2·5
—	P.M.	Cloudy			weather.					

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APPENDIX. TABLE I.—Cape of Good Hope.

1829.	Time.	Chronom. (902).	Clock.	Difference.
		h m s	h m s	h m s
August 13	Noon	12 1 12	10 53 0	1 8 12
—	——	12 23 13	11 15 0	1 8 13
—	P.M.	6 51 31·5	5 43 0	1 8 31·5
—	——	7 9 32·5	6 1 0	1 8 32·5
—	——	8 31 36·5	7 23 0	1 8 36·5
—	——	9 43 40	8 35 0	1 8 40
—	——	10 34 42·5	9 26 0	1 8 42·5
—	——	11 24 45	10 16 0	1 8 45
		Experiments with No. 10 Pendulum.		
27	Noon	11 43 9·5	10 18 30	1 24 39·5
—	——	12 24 41·5	11 0 0	1 24 41·5
—	P.M.	7 14 1·5	5 49 0	1 25 1·5
—	——	7 54 33·5	6 29 30	1 25 3·5
—	——	8 56 6·5	7 31 0	1 25 6·5
—	——	10 49 12	9 24 0	1 25 12
28	Noon	12 5 20·5	10 39 30	1 25 50·5
—	——	12 25 51·5	11 0 0	1 25 51·5
—	P.M.	8 5 43·5	6 39 30	1 26 13·5
—	——	9 7 46·5	7 41 30	1 26 16·5
—	——	9 48 48·5	8 22 30	1 26 18·5
—	——	10 29 50·5	9 3 30	1 26 20·5
29	Noon	11 59 59	10 33 0	1 26 59
—	——	12 21 30	11 54 30	1 27 0
September 1	P.M.	7 47 22·5	6 16 30	1 30 52·5
—	——	8 35 55	7 5 0	1 30 55
—	——	9 15 57	7 45 0	1 30 57
2	Noon	11 51 10	10 19 30	1 31 40
—	——	12 21 11·5	10 49 30	1 31 41·5
—	P.M.	7 43 3	6 11 0	1 32 3
—	——	8 32 35·5	7 0 30	1 32 5·5
—	——	9 23 8	7 51 0	1 32 8
—	——	10 13 10·5	8 41 0	1 32 10·5
4	A.M.	5 20 42	3 47 0	1 33 42
—	——	5 52 13·5	4 18 30	1 33 43·5

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Appendix. Table I.—Cape of Good Hope.

1829.	Time.	Chronom. (902).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
September 4	A.M.	7	3	17	5	29	30	1	33	47
—	Noon	12	2	1·5	10	28	0	1	34	1·5
—	——	12	23	2·5	10	49	0	1	34	2·5
—	P.M.	8	28	26	6	54	0	1	34	26
		Experiments with convertible Pendulums.								
October 26	A.M.	5	2	4·5	0	7	0	4	55	4·5
—	——	5	48	2·5	0	53	0	4	55	2·5
—	——	7	6	59	2	12	0	4	54	59
—	——	7	30	58	2	36	0	4	54	58
—	Noon	11	41	47	6	47	0	4	54	47
—	——	12	26	45	7	32	0	4	54	45
—	P.M.	7	14	27	2	20	0	4	54	27
—	——	8	13	24·5	3	19	0	4	54	24·5
—	——	9	9	0	4	14	38	4	54	22
—	——	10	29	18·5	5	35	0	4	54	18·5
27	A.M.	4	32	2·5	11	38	0	4	54	2·5
—	——	4	55	1·5	0	1	0	4	54	1·5
—	——	5	7	1	0	13	0	4	54	1
—	——	5	39	59·5	0	46	0	4	53	59·5
—	——	5	51	59	0	58	0	4	53	59
—	——	7	11	55·5	2	18	0	4	53	55·5
—	——	7	34	54·5	2	41	0	4	53	54·5
—	Noon	11	54	43	7	1	0	4	53	43
—	——	12	16	42	7	23	0	4	53	42
—	P.M.	7	14	23·5	2	21	0	4	53	23·5
—	——	7	38	22·5	2	45	0	4	53	22·5
—	——	8	1	21·5	3	8	0	4	53	21·5
—	——	8	47	19·5	3	54	0	4	53	19·5
—	——	9	9	18·5	4	16	0	4	53	18·5
—	——	9	43	17	4	50	0	4	53	17
—	——	10	8	16	5	15	0	4	53	16
28	A.M.	4	18	59·5	11	26	0	4	52	59·5
—	——	4	52	58	12	0	0	4	52	58
—	——	5	14	57	0	22	0	4	52	57

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APPENDIX. TABLE I.—Cape of Good Hope.

1829.	Time.	Chronom. (902).			Clock.			Difference.			
		h	m	s	h	m	s	h	m	s	
October 28	A.M.	5	37	56	0	45	0	4	52	56	
—	——	7	8	52	2	16	0	4	52	52	
—	——	7	31	51	2	39	0	4	52	51	
—	Noon	11	51	39·5	6	59	0	4	52	39·5	
—	——	12	13	38·5	7	21	0	4	52	38·5	
—	——	12	35	37·5	7	43	0	4	52	37·5	
—	P.M.	5	49	23·5	0	57	0	4	52	23·5	
—	——	6	58	20·5	2	6	0	4	52	20·5	
—	——	7	32	19	2	40	0	4	52	19	
—	——	7	43	18·5	2	51	0	4	52	18·5	
—	——	8	6	17·5	3	14	0	4	52	17·5	
—	——	9	26	14	4	34	0	4	52	14	
—	——	10	23	11·5	5	31	0	4	52	11·5	
29	A.M.	4	11	56	11	20	0	4	51	56	
—	——	4	35	55	11	44	0	4	51	55	
—	——	5	11	53·5	0	20	0	4	51	53·5	
—	——	5	32	52·5	0	41	0	4	51	52·5	
—	——	7	3	48·5	2	12	0	4	51	48·5	
—	——	7	25	47·5	2	34	0	4	51	47·5	
—	Noon	11	56	35·5	7	5	0	4	51	35·5	
—	——	12	18	34·5	7	27	0	4	51	34·5	
—	P.M.	6	52	17	2	1	0	4	51	17	
30	A.M.	4	50	50·5	0	0	0	4	50	50·5	*
—	——	5	0	32	0	9	0	4	51	32	*
—	——	5	36	30·5	0	45	0	4	51	30·5	
—	——	6	54	27	2	3	0	4	51	27	
—	——	7	17	26	2	26	0	4	51	26	
—	Noon	0	2	13·5	7	11	0	4	51	13·5	
—	——	0	13	13	7	22	0	4	51	13	
—	P.M.	5	42	58·5	0	52	0	4	50	58·5	
—	——	6	52	55·5	2	2	0	4	50	55·5	
—	——	7	15	54·5	2	25	0	4	50	54·5	
—	——	7	50	53	3	0	0	4	50	53	
—	——	8	35	52	3	45	0	4	50	52	

* Before stoppage the minute hand was fouled by the hour hand, and the Pendulum, although oscillating the seconds' hand, did not register its vibrations for 41½ seconds of the Chronometer.

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Appendix. Table I.—Cape of Good Hope.

1829.	Time.	Chronom. (902).	Clock.	Difference.
		h m s	h m s	h m s
October 30	P.M.	8 58 50	4 8 0	4 50 50
—	——	9 55 47·5	5 5 0	4 50 47·5
31	A.M.	4 11 31	11 21 0	4 50 31
—	——	4 45 29·5	11 55 0	4 50 29·5
—	——	4 56 29	0 6 0	4 50 29
—	——	5 31 27·5	1 41 0	4 50 27·5
—	——	6 51 24	2 1 0	4 50 24
—	Noon	11 57 10·5	7 7 0	4 50 10·5
—	P.M.	2 46 3	9 56 0	4 50 3
—	——	3 30 1	10 40 0	4 50 1
—	——	5 47 55	0 58 0	4 49 55
—	——	6 56 52	2 7 0	4 49 52
—	——	7 19 51	2 30 0	4 49 51
—	——	10 0 44	5 11 0	4 49 44
		Experiment with	Copper Pendulum.	
November 2	——	6 51 46	2 4 0	4 47 46
—	——	7 14 45	2 27 0	4 47 45
—	——	7 38 44	2 51 0	4 47 44
—	——	9 45 38·5	4 58 0	4 47 38·5
3	A.M.	4 48 20	0 1 0	4 47 20
—	——	5 24 18·5	0 37 0	4 47 18·5
—	——	6 44 15	1 57 0	4 47 15
—	——	7 42 12·5	2 55 0	4 47 12·5
—	——	8 17 11	3 30 0	4 47 11
—	P.M.	5 20 47	0 34 0	4 46 47
—	——	6 19 44·5	1 33 0	4 46 44·5
—	——	6 41 43·5	1 55 0	4 46 43·5
—	——	7 5 42·5	2 19 0	4 46 42·5
—	——	8 37 38·5	3 51 0	4 46 38·5
—	——	9 24 36·5	4 38 0	4 46 36·5
—	——	9 46 35·5	5 0 0	4 46 35·5
4	A.M.	4 48 17	0 2 0	4 46 17
—	——	5 12 16	0 26 0	4 46 16
—	——	6 43 12	1 57 0	4 46 12

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Appendix. Table I.—Cape of Good Hope.

1829.	Time.	Chronom. (902).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
November 4	A.M.	6	54	11·5	2	8	0	4	46	11·5
—	Noon	11	52	58·5	7	7	0	4	45	58·5
—	——	12	26	57	7	41	0	4	45	57
—	P.M.	5	20	44	0	35	0	4	45	44
—	——	6	41	40·5	1	56	0	4	45	40·5
—	——	7	4	39·5	2	19	0	4	45	39·5
—	——	7	27	38·5	2	42	0	4	45	38·5
—	——	8	35	35·5	3	50	0	4	45	35·5
—	——	9	44	32·5	5	59	0	4	45	32·5
5	A.M.	4	37	14·5	11	52	0	4	45	14·5
—	——	5	12	13	0	27	0	4	45	13
—	——	6	42	9	1	57	0	4	45	9
—	——	6	54	8·5	2	9	0	4	45	8·5
—	Noon	12	25	54	7	41	0	4	44	54
—	P.M.	4	58	42	0	14	0	4	44	42
—	——	5	9	41·5	0	25	0	4	44	41·5
—	——	6	32	38	1	48	0	4	44	38
—	——	7	42	35	2	58	0	4	44	35
—	——	8	27	33	3	43	0	4	44	33
—	——	9	14	31	4	30	0	4	44	31
—	——	9	38	30	4	54	0	4	44	30
6	A.M.	4	31	12	11	47	0	4	44	12
		After this comparison the Clock stopped.								
—	——	5	16	46	0	15	0	5	1	46
—	——	6	2	44	1	1	0	5	1	44
—	——	6	37	42·5	1	36	0	5	1	42·5
—	——	6	49	42	1	48	0	5	1	42
—	Noon	11	47	29	6	46	0	5	1	29
—	——	12	10	28	7	9	0	5	1	28
—	P.M.	4	55	15·5	11	54	0	5	1	15·5
—	——	5	6	15	0	5	0	5	1	15
—	——	6	27	11·5	1	26	0	5	1	11·5
—	——	7	3	10	2	2	0	5	1	10
—	——	9	10	4·5	4	9	0	5	1	4·5

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Appendix. Table I.—Cape of Good Hope.

1829.	Time.	Chronom. (902).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
November 6	P.M.	9	32	3·5	4	31	0	5	1	3·5
7	A.M.	4	36	45	11	36	0	5	0	45
—	——	5	10	43·5	0	10	0	5	0	43·5
—	——	6	30	40	1	30	0	5	0	40
—	——	6	41	39·5	1	41	0	5	0	39·5
—	Noon	11	28	27	6	28	0	5	0	27
—	——	12	13	25	7	13	0	5	0	25
—	P.M.	5	9	12	0	9	0	5	0	12
—	——	6	42	8	1	42	0	5	0	8
—	——	7	17	6·5	2	17	0	5	0	6·5
—	——	8	4	4·5	3	4	0	5	0	4·5
—	——	8	26	3·5	3	26	0	5	0	3·5
—	——	9	36	0·5	4	36	0	5	0	0·5
8	A.M.	4	29	42·5	11	30	0	4	59	42·5
—	——	5	4	41	0	5	0	4	59	41
—	——	6	24	37·5	1	25	0	4	59	37·5
—	——	6	47	36·5	1	48	0	4	59	36·5
—	——	7	20	35	2	21	0	4	59	35
—	Noon	11	46	23·5	6	47	0	4	59	23·5
—	——	12	20	22	7	21	0	4	59	22
—	P.M.	5	4	9·5	0	5	0	4	59	9·5
—	——	6	14	6·5	1	15	0	4	59	6·5
—	——	6	46	5	1	47	0	4	59	5
—	——	7	22	3·5	2	33	0	4	59	3·5
—	——	8	20	1	3	21	0	4	59	1
—	——	10	14	56	5	16	0	4	58	56
9	A.M.	4	56	38·5	11	58	0	4	58	38·5
—	——	6	39	34	1	41	0	4	58	34
Commencement of Experiments with Iron Pendulum—(2d Series).										
14	A.M.	3	36	9·5	4	29	0	0	52	50·5
—	——	4	39	7	6	32	0	0	52	53
—	——	6	7	3·5	7	0	0	0	52	56·5
—	Noon	11	55	49·5	12	49	0	0	53	10·5
—	——	0	20	48·5	1	14	0	0	53	11·5

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APPENDIX. TABLE I.—Cape of Good Hope.

1829.	Time.	Chronom. (902).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
November 14	P.M.	5	54	35	6	48	0	0	53	25
—	——	6	57	32·5	7	51	0	0	53	27·5
—	——	8	0	30	8	54	0	0	53	30
—	——	9	4	27·5	9	58	0	0	53	32·5
15	A.M.	3	43	11·5	4	37	0	0	53	48·5
—	——	4	33	9·5	5	27	0	0	53	50·5
—	——	6	13	5·5	7	7	0	0	53	54·5
—	Noon	11	23	53	12	18	0	0	54	7
—	——	0	25	50·5	1	20	0	0	54	9·5
—	P.M.	4	19	41	5	14	0	0	54	19
—	——	6	25	36	7	20	0	0	54	24
—	——	8	56	30	9	51	0	0	54	30
16	A.M.	3	35	14	4	30	0	0	54	46
—	——	4	0	13	4	55	0	0	54	47
—	——	4	26	12	6	21	0	0	54	48
—	——	5	52	8·5	6	47	0	0	54	51·5
—	——	6	55	6	7	50	0	0	54	54
—	Noon	11	42	54·5	12	38	0	0	55	5·5
—	P.M.	4	16	43·5	5	12	0	0	55	16·5
—	——	4	41	42·5	5	37	0	0	55	17·5
—	——	5	57	39·5	6	53	0	0	55	20·5
—	——	6	35	38	7	31	0	0	55	22
—	——	6	48	37·5	7	44	0	0	55	22·5
—	——	7	52	35	8	48	0	0	55	25
—	——	8	56	32·5	9	52	0	0	55	27·5
17	A.M.	3	51	16	4	57	0	0	55	44
—	——	4	28	14·5	5	24	0	0	55	45·5
—	——	5	56	11	6	52	0	0	55	49
—	——	6	9	10·5	7	5	0	0	55	49·5
—	——	6	47	9	7	43	0	0	55	51
—	——	11	59	56·5	12	56	0	0	56	3·5
—	Noon	0	23	55·5	1	20	0	0	56	4·5
—	P.M.	7	26	38·5	8	23	0	0	56	21·5
18	A.M.	6	32	12	7	29	0	0	56	48

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Appendix. Table I.—Cape of Good Hope.

1829.	Time.	Chronom. (902).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
November 18	A.M.	6	44	11·5	7	41	0	0	56	48·5
—	Noon	11	48	59·5	12	46	0	0	57	0·5
—	——	0	14	58·5	1	12	0	0	57	1·5
—	P.M.	5	43	45·5	6	41	0	0	57	14·5
—	——	6	21	44	7	19	0	0	57	16
—	——	7	0	42·5	7	58	0	0	57	17·5
—	——	7	38	41	8	36	0	0	57	19
—	——	8	42	38·5	9	40	0	0	57	21·5
19	A.M.	3	51	21·5	4	49	0	0	57	38·5
—	——	4	15	20·5	5	13	0	0	57	39·5
—	——	6	8	16	7	6	0	0	57	44
—	——	6	21	15·5	7	19	0	0	57	44·5
—	——	6	47	14·5	7	45	0	0	57	45·5
—	Noon	11	59	2	12	57	0	0	57	58
—	——	0	24	1	1	22	0	0	57	59
—	P.M.	6	3	47·5	7	2	0	0	58	12·5
—	——	7	32	44	8	31	0	0	58	16
—	——	8	23	42	9	22	0	0	58	18
—	——	8	49	41	9	48	0	0	58	19
20	A.M.	3	46	24·5	4	45	0	0	58	35·5
—	——	4	11	23·5	5	10	0	0	58	36·5
—	——	5	52	19·5	6	51	0	0	58	40·5
—	Noon	11	58	5	12	57	0	0	58	55
—	——	0	24	4	1	23	0	0	58	56
—	P.M.	3	42	56	4	42	0	0	59	4
—	——	5	36	52·5	6	36	0	0	59	7·5
—	——	6	0	50·5	7	0	0	0	59	9·5
—	——	6	14	50	7	14	0	0	59	10
—	——	6	27	49·5	7	27	0	0	59	10·5
—	——	7	30	47	8	30	0	0	59	13
—	——	8	21	45	9	21	0	0	59	15
—	——	8	45	44	9	45	0	0	59	16
21	A.M.	3	42	27·5	4	42	0	0	59	32·5
—	——	4	8	26·5	5	8	0	0	59	33·5

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APPENDIX. TABLE I.—Cape of Good Hope.

1829.	Time.	Chronom. (902).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
November 21	A.M.	6	37	20·5	7	37	0	0	59	39·5
—	Noon	11	55	8	12	55	0	0	59	52
—	——	0	19	7	1	19	0	0	59	53
—	P.M.	3	26	59·5	4	27	0	1	0	0·5
—	——	5	56	53·5	6	57	0	1	0	6·5
—	——	6	34	52	7	35	0	1	0	8
—	——	7	25	50	8	26	0	1	0	10
—	——	8	16	48	9	17	0	1	0	12
—	——	8	41	47	9	42	0	1	0	13
22	A.M.	3	37	30·5	4	38	0	1	0	29·5
—	——	4	3	29·5	5	4	0	1	0	30·5
—	——	6	8	24·5	7	9	0	1	0	35·5
—	——	6	34	23·5	7	35	0	1	0	36·5
—	Noon	0	4	10·5	1	5	0	1	0	49·5
—	——	0	28	9·5	1	29	0	1	0	50·5
—	P.M.	3	35	2	4	36	0	1	0	58
—	——	4	12	0·5	5	13	0	1	0	59·5
—	——	6	4	56	7	6	0	1	1	4
—	——	6	29	55	7	31	0	1	1	5
—	——	7	20	53	8	22	0	1	1	7
—	——	8	36	50	9	38	0	1	1	10
23	A.M.	2	50	35	3	52	0	1	1	25
—	——	3	15	34	4	17	0	1	1	26
				St. Helena.						
1830.										
January 6	P.M.	10	23	0	7	55	0	2	28	0
—	——	10	48	2	8	20	0	2	28	2
—	——	12	35	10·5	10	7	0	2	28	10·5
7	A.M.	8	35	18·5	6	6	30	2	28	48·5
—	P.M.	3	3	19	0	34	0	2	29	19
—	——	9	40	50	7	11	0	2	29	50
—	——	11	33	59	9	4	0	2	29	59
—	——	12	24	33	9	54	30	2	30	3

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Appendix. Table I.—St. Helena.

1830.	ime.	Chronom. (929).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
January 7	P.M.	12	56	5·5	10	26	0	2	30	5·5
8	A.M.	1	46	6·5	11	15	0	2	31	6·5
—	Noon	2	24	9·5	12	53	0	2	31	9·5
—	P.M.	9	43	44	7	12	0	2	31	44
—	——	10	15	16·5	7	43	30	2	31	46·5
—	——	11	11	51	8	40	0	2	31	51
—	——	11	37	23	9	5	30	2	31	53
—	——	12	46	58·5	10	15	0	2	31	58·5
9	Noon	13	54	30·5	11	21	30	2	33	0·5
—	——	14	25	33	11	52	30	2	33	3
—	P.M.	9	26	36	6	53	0	2	33	36
—	——	10	10	39·5	7	37	0	2	33	39·5
—	——	11	26	15·5	8	52	30	2	33	45·5
—	——	12	29	51·5	9	56	0	2	33	51·5
—	——	12	48	52	10	15	0	2	33	52
10	Noon	13	54	24	11	19	30	2	34	54
—	——	14	19	56	11	45	0	2	34	56
—	P.M.	9	34	30	6	59	0	2	35	30
—	——	9	46	31	7	11	0	2	35	31
—	——	10	30	34·5	7	55	0	2	35	34·5
—	——	12	25	13·5	9	49	30	2	35	43·5
—	——	12	44	15	10	8	30	2	35	45
11	——	13	51	47	11	15	0	2	36	47
—	Noon	14	24	49·5	11	48	0	2	36	49·5
—	P.M.	9	25	22·5	6	48	0	2	37	22·5
—	——	10	3	25·5	7	26	0	2	37	25·5
—	——	10	28	27·5	7	51	0	2	37	27·5
—	——	11	19	31·5	8	42	0	2	37	31·5
—	——	12	23	6·5	9	45	30	2	37	36·5
—	——	12	42	8	10	4	30	2	37	38
12	Noon	14	2	41	11	24	0	2	38	41
—	——	14	28	13	11	49	30	2	38	43
—	P.M.	9	27	16	6	48	0	2	39	16
—	——	10	23	50·5	7	44	30	2	39	20·5

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APPENDIX. TABLE I.—St. Helena.

1830.	Time.	Chronom. (929).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
January 12	P.M.	11	14	54·5	8	35	30	2	39	24·5
—	——	12	18	29·5	9	39	0	2	39	29·5
13	Noon	13	58	4	11	17	30	2	40	34
—	——	14	23	36	11	43	0	2	40	36
—	P.M.	No Stars observed—Sky densely overcast.								
14	Noon	14	7	28	11	25	0	2	42	28
—	P.M.	9	15	1·5	6	32	0	2	43	1·5
—	——	9	34	3	6	51	0	2	43	3
—	——	10	18	6·5	7	35	0	2	43	6·5
—	——	11	9	40·5	8	26	30	2	43	10·5
—	——	12	7	15	9	24	0	2	43	15
—	——	12	25	46·5	9	42	30	2	43	16·5
15	Noon	14	0	20·5	11	16	0	2	44	20·5
—	P.M.	9	57	28	7	13	30	2	43	58
16	Noon	2	5	14	11	19	0	2	46	14
—	——	2	44	17	11	58	0	2	46	17
—	P.M.	9	14	47·5	6	28	0	2	46	47·5
17	Noon	14	32	9	11	44	0	2	48	9
—	P.M.	9	22	11	6	33	30	2	48	41
—	——	10	6	44·5	7	18	0	2	48	44·5
—	——	10	51	48	8	3	0	2	48	48
—	——	12	0	53·5	9	12	0	2	48	53·5
—	——	12	13	54·5	9	25	0	2	48	54·5
18	Noon	14	8	0	11	18	0	2	50	0
—	——	14	28	1·5	11	38	0	2	50	1·5
Commencement of the Experiments with the convertible Pendulums.										
22	Noon	14	59	23	10	16	0	4	43	23
—	P.M.	8	44	20·7	4	1	0	4	43	20·7
—	——	9	8	20·5	4	25	0	4	43	20·5
—	——	10	33	20	5	50	0	4	43	20
—	——	11	54	19·5	7	11	0	4	43	19·5
23	Noon	14	13	14·2	9	30	0	4	43	14·2
—	——	14	31	14	9	48	0	4	43	14
—	P.M.	8	52	11·5	4	9	0	4	43	11·5

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Appendix. Table I.—St. Helena.

1830.	Time.	Chronom. (929).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
January 23	P.M.	12	43	10	8	0	0	4	43	10
24	Noon	2	56	4·5	10	13	0	4	43	4·5
—	P.M.	8	58	2	4	15	0	4	43	2
—	——	10	24	1·5	5	41	0	4	43	1·5
—	——	11	46	1	7	3	0	4	43	1
25	Noon	2	27	55·5	9	45	0	4	42	55·5
—	P.M.	10	26	52	5	44	0	4	42	52
—	——	11	39	51·5	6	57	0	4	42	51·5
27	Noon	2	27	37	9	45	0	4	42	37
—	P.M.	9	36	34	4	54	0	4	42	34
—	——	10	53	33·5	6	11	0	4	42	33·5
—	——	11	12	33	7	34	0	4	42	33
28	——	10	9	24·5	5	27	0	4	42	24·5
—	——	11	16	24	6	34	0	4	42	24
				Ascension Island.						
February 26	P.M.	9	54	28·5	6	18	0	3	36	28·5
—	——	11	29	37	7	53	0	3	36	37
—	——	12	3	40	8	27	0	3	36	40
27	A.M.	6	20	13·5	2	43	0	3	37	13·5
—	——	6	36	45	2	59	30	3	37	15
—	——	8	35	25·5	4	58	0	3	37	25·5
—	——	9	2	28	5	25	0	3	37	28
—	P.M.	9	11	32·5	5	33	0	3	38	32·5
—	——	9	56	6·5	6	17	30	3	38	36·5
—	——	10	12	38	6	34	0	3	38	38
—	——	10	57	42	7	19	0	3	38	42
—	——	11	25	44·5	7	47	0	3	38	44·5
—	——	12	4	48	8	26	0	3	38	48
28	A.M.	7	56	0	4	16	30	3	39	30
—	——	8	2	30·5	4	23	0	3	39	30·5
—	——	8	25	2·5	4	45	30	3	39	32·5

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APPENDIX. TABLE I.—Ascension Island.

1830.	Time.	Chronom. (929).	Clock.	Difference.
		h m s	h m s	h m s
February 28	A.M.	8 41 34	5 2 0	3 39 34
—	P.M.	9 13 40·5	5 33 0	3 40 40·5
—	——	9 53 44	6 13 0	3 40 44
—	——	10 9 45·5	6 29 0	3 40 45·5
—	——	10 54 49·5	7 14 0	3 40 49·5
—	——	12 1 55·5	8 21 0	3 40 55·5
March 1	A.M.	7 54 37·5	4 13 0	3 41 37·5
—	——	8 22 40	4 41 0	3 41 40
—	——	8 39 41·5	4 58 0	3 41 41·5
—	P.M.	9 17 48·5	5 35 0	3 42 48·5
—	——	9 50 51·5	6 8 0	3 42 51·5
—	——	10 2 52·5	6 20 0	3 42 52·5
—	——	10 52 57	7 10 0	3 42 57
—	——	11 54 32·5	8 11 30	3 43 2·5
2	A.M.	7 53 45	4 10 0	3 43 45
—	——	8 22 47·5	4 39 0	3 43 47·5
—	——	8 33 48·5	4 50 0	3 43 48·5
—	P.M.	9 12 55·5	5 28 0	3 44 55·5
—	——	10 3 0	6 18 0	3 45 0
—	——	10 54 4·5	7 9 0	3 45 4·5
—	——	11 50 9·5	8 5 0	3 45 9·5
3	A.M.	7 46 52	4 1 0	3 45 52
—	——	8 8 54	4 23 0	3 45 54
—	——	8 31 56	4 46 0	3 45 56
—	P.M.	9 9 3	5 22 0	3 47 3
—	——	9 42 6	5 55 0	3 47 6
—	——	9 59 7·5	6 12 0	3 47 7·5
—	——	10 49 12	7 2 0	3 47 12
—	——	11 51 17·5	8 4 0	3 47 17·5
4	A.M.	8 26 3·5	4 38 0	3 48 3·5
—	P.M.	9 35 13·5	5 46 0	3 49 13·5
—	——	9 40 14	5 51 0	3 49 14
—	——	9 51 15	6 2 0	3 49 15
—	——	10 36 19	6 47 0	3 49 19

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Appendix. Table I.—Ascension Island.

1830.	Time.	Chronom. (929).	Clock.	Difference.
		h m s	h m s	h m s
March 4	P.M.	11 42 25	7 53 0	3 49 25
5	A.M.	7 38 7·5	3 48 0	3 50 7·5
—	——	8 0 9·5	4 10 0	3 50 9·5
—	——	8 23 11·5	4 33 0	3 50 11·5
—	——	8 34 12·5	4 44 0	3 50 12·5*
—	P.M.	8 59 19	5 8 0	3 51 19
—	——	9 38 22·5	5 47 0	3 51 22·5
—	——	9 49 23·5	5 58 0	3 51 23·5
6	A.M.	7 30 15·5	3 38 0	3 52 15·5
—	——	7 58 18	4 6 0	3 52 18
—	——	8 20 20	4 28 0	3 52 20
—	P.M.	9 0 27·5	5 7 0	3 53 27·5
—	——	9 28 30	5 35 0	3 53 30
—	——	9 50 32	5 57 0	3 53 32
—	——	11 31 41	7 38 0	3 53 41
7	A.M.	7 54 26	4 0 0	3 54 26
—	——	8 16 58	4 22 30	3 54 28
—	P.M.	8 59 35·5	5 4 0	3 55 35·5
—	——	9 26 38	5 31 0	3 55 38
8	A.M.	7 26 31·5	3 30 0	3 56 31·5
—	——	7 49 33·5	3 53 0	3 56 33·5
—	——	8 17 36	4 21 0	3 56 36
—	P.M.	8 49 42·5	4 52 0	3 57 42·5
—	——	9 22 45·5	5 25 0	3 57 45·5
—	——	9 39 47	5 42 0	3 57 47
—	——	11 3 54·5	7 6 0	3 57 54·5
—	——	11 25 56·5	7 28 0	3 57 56·5
9	A.M.	7 23 39	3 25 0	3 58 39
—	——	7 45 41	3 47 0	3 58 41
—	——	8 8 43	4 10 0	3 58 43
—	P.M.	8 47 50	4 48 0	3 59 50
—	——	9 15 52·5	5 16 0	3 59 52·5
10	A.M.	7 21 46·5	3 21 0	4 0 46·5
—	——	7 38 48	3 38 0	4 0 48

* After winding up the Clock.

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APPENDIX. TABLE I.—Ascension Island.

1830.	Time.	Chronom. (929).	Clock.	Difference.
		h m s	h m s	h m s
March 10	A.M.	8 6 50·5	4 6 0	4 0 50·6
	Commencement of Experiments with Convertible Pendulums.			
17	P.M.	9 32 8·5	5 14 0	4 18 8·5
—	——	10 30 9	6 12 0	4 18 9
—	——	12 50 10	8 32 0	4 18 10
18	A.M.	8 3 13	3 45 0	4 18 13
—	——	9 19 13·5	5 1 0	4 18 13·5
—	P.M.	9 30 18	5 12 0	4 18 18 *
—	——	9 43 18	5 25 0	4 18 18 *
—	——	10 45 18·5	6 27 0	4 18 18·5
19	A.M.	8 37 22·5	4 19 0	4 18 22·5
—	——	9 54 23	5 36 0	4 18 23
—	P.M.	9 5 27	4 47 0	4 18 27
—	——	10 16 27·5	5 58 0	4 18 27·5
—	——	11 29 28	7 11 0	4 18 28
20	A.M.	8 19 31·5	4 1 0	4 18 31·5
—	——	9 30 32	5 12 0	4 18 32
—	P.M.	8 29 36	4 11 0	4 18 36
—	——	9 43 36·5	5 25 0	4 18 36·5
—	——	10 49 37	6 31 0	4 18 37
21	A.M.	9 0 41	4 42 0	4 18 41
—	——	9 58 41·5	5 40 0	4 18 41·5
—	P.M.	8 29 45	4 11 0	4 18 45
—	——	9 45 45·5	5 27 0	4 18 45·5
—	——	10 55 46	6 37 0	4 18 46
22	A.M.	8 10 49·5	3 52 0	4 18 49·5
—	——	9 25 50	5 7 0	4 18 50
—	P.M.	9 33 54	5 15 0	4 18 54
—	——	10 45 54·5	6 27 0	4 18 54·5
23	A.M.	8 5 58	3 47 0	4 18 58
—	——	9 34 58·5	5 16 0	4 18 58·5
—	P.M.	8 55 2	4 36 0	4 19 2
—	——	10 26 2·5	6 7 0	4 19 2·5

* Coincident during this interval to my ear.

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Appendix. Table I.—Ascension Island.

1830.	Time.	Chronom. (929).	Clock.	Difference.
		h m s	h m s	h m s
March 24	A.M.	8 52 6·5	4 33 0	4 19 6·5
—	——	10 7 7	5 48 0	4 19 7
—	P.M.	9 57 11	5 38 0	4 19 11
—	——	11 9 11·5	6 50 0	4 19 11·5
25	A.M.	8 23 15	4 4 0	4 19 15
—	——	9 40 15·5	5 21 0	4 19 15·5
—	P.M.	8 59 19·5	4 40 0	4 19 19·5
—	——	10 18 20	5 59 0	4 19 20
26	A.M.	8 25 24	4 6 0	4 19 24
—	——	9 39 24·5	5 20 0	4 19 24·5
—	P.M.	9 15 28·5	4 56 0	4 19 28·5
—	——	19 31 29	6 12 0	4 19 29
27	A.M.	7 51 32·5	3 32 0	4 19 32·5
—	——	9 8 33	4 49 0	4 19 33
—	P.M.	9 10 37	4 51 0	4 19 37
—	——	10 18 37·5	5 59 0	4 19 37·5
—	——	7 47 41	3 28 0	4 19 41
28	A.M.	9 57 41·5	4 38 0	4 19 41·5
29	——	9 31 51	5 12 0	4 19 51
—	P.M.	9 25 55·5	5 6 0	4 19 55·5
30	A.M.	7 53 0	3 33 0	4 20 0
—	——	9 1 0·5	4 41 0	4 20 0·5
	Here end the Pendulum Experiments at the Lower Station.			
Commencement of Experiments with No. 10 Pendulum at the Upper Station.				
April 8	Noon	2 33 32	11 21 0	3 12 32
9	——	2 32 45·5	11 18 0	3 14 45·5
—	——	3 4 48·5	11 50 0	3 14 48·5
—	P.M.	8 50 20·5	5 35 0	3 15 20·5
—	——	9 23 23·5	6 8 0	3 15 23·5
10	A.M.	13 4 51	9 48 0	3 16 51
—	Noon	3 4 2	11 47 0	3 17 2
11	——	14 37 43	11 18 30	3 19 13
—	——	14 59 15	11 40 0	3 19 15

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Appendix. Table I.—Ascension Island.

1830.	Time.	Chronom. (929).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
April 12	Noon	14	39	26·5	11	18	0	3	21	26·5
—	——	15	1	58·5	11	40	30	3	21	28·5
13	——	14	57	41	11	34	0	3	23	41
14	——	14	49	23	11	23	30	3	25	53
—	——	15	0	24	11	34	30	3	25	54
				Fernando de Noronha.						
June 21	P.M.	11	20	12·2	7	6	0	4	14	12·2
—	——	12	9	16	7	55	0	4	14	16
—	——	14	6	25	9	52	0	4	14	25
22	Noon	3	50	27	11	35	0	4	15	27
—	——	4	23	29·5	0	8	0	4	15	29·5
—	P.M.	11	10	0	6	54	0	4	16	0
—	——	12	28	6	8	12	0	4	16	6
—	——	13	54	12·5	9	38	0	4	16	12·5
23	Noon	3	49	15·5	11	32	0	4	17	15·5
—	——	4	22	18	0	5	0	4	17	18
—	P.M.	10	55	47·5	6	38	0	4	17	47·5
—	——	12	0	54	8	3	0	4	17	54
—	——	13	47	0·5	9	29	0	4	18	0·5
24	Noon	3	48	4	11	29	0	4	19	4
—	——	4	21	6·5	0	2	0	4	19	6·5
—	P.M.	10	40	35	6	21	0	4	19	35
—	——	12	19	42·5	8	0	0	4	19	42·5
—	——	13	45	49	9	26	0	4	19	49
25	Noon	3	55	53	11	35	0	4	20	53
—	——	4	22	55	0	2	0	4	20	55
—	P.M.	10	56	24·5	6	35	0	4	21	24·5
—	——	13	42	37	9	21	0	4	21	37
26	Noon	3	51	41	11	29	0	4	22	41
—	——	4	31	44	0	9	0	4	22	44
—	P.M.	10	51	12·5	6	28	0	4	23	12·5
—	——	12	10	18·5	7	47	0	4	23	18·5

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Appendix. Table I.—Fernando de Noronha.

1830.	Time.	Chronom. (929).	Clock.	Difference.
		h m s	h m s	h m s
June 26	P.M.	13 42 25·5	9 19 0	4 23 25·5
27	Noon	3 50 29·5	11 26 0	4 24 29·5
—	——	4 23 32	11 59 0	4 24 32
—	P.M.	10 42 0·5	6 17 0	4 25 0·5
—	——	12 7 7	6 42 0	4 25 7
—	——	13 32 13·5	9 7 0	4 25 13·5
28	Noon	3 51 18·5	11 25 0	4 26 18·5
—	——	4 24 21	11 58 0	4 26 21
—	P.M.	10 42 49·5	6 16 0	4 26 49·5
—	——	12 1 55·5	7 35 0	4 26 55·5
—	——	1 34 2·5	9 7 0	4 27 2·5
29	Noon	3 47 7	11 19 0	4 28 7
—	——	4 27 10	11 59 0	4 28 10
—	P.M.	10 38 38	6 10 0	4 28 38
—	——	11 56 44	7 28 0	4 28 44
—	——	13 35 51·5	9 7 0	4 28 51·5
30	Noon	3 45 56	11 16 0	4 29 56
—	——	4 25 59	11 56 0	4 29 59
—	P.M.	10 36 27	6 6 0	4 30 27
—	——	11 55 33	7 25 0	4 30 33
—	——	13 26 40	8 56 0	4 30 40
July 1	Noon	3 56 46	11 25 0	4 31 46
—	——	4 22 48	11 51 0	4 31 48
—	P.M.	10 34 16	6 2 0	4 32 16
—	——	11 46 21·5	7 14 0	4 32 21·5
—	——	13 24 29	8 52 0	4 32 29
2	Noon	3 53 35	11 20 0	4 33 35
—	——	4 26 37·5	11 53 0	4 33 37·5
		Maranham.		
August 3	Noon	10 55 4·5	12 48 0	1 52 55·5
—	P.M.	5 59 40	7 52 0	1 52 20
—	——	7 16 46·5	9 9 0	1 52 13·5

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Appendix. Table I.—Maranham.

1830.	Time.	Chronom. (929).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
August 4	Noon	9	53	30	11	44	30	1	51	0
—	P.M.	5	11	36·5	7	2	0	1	50	23·5
—	——	5	52	40	7	43	0	1	50	20
—	——	7	21	47·5	9	12	0	1	50	12·5
5	Noon	9	53	30·5	11	42	30	1	48	59·5
—	P.M.	5	52	10·5	7	40	30	1	48	19·5
—	——	7	9	47	8	58	0	1	48	13
6	Noon	9	46	0·5	11	33	0	1	46	59·5
—	P.M.	5	22	38·5	7	9	0	1	46	21·5
—	——	7	27	49	9	14	0	1	46	11
7	Noon	10	5	2·5	11	50	0	1	44	57·5
—	P.M.	5	17	38·5	7	2	0	1	44	21·5
—	——	6	58	47	8	43	0	1	44	13
8	Noon	10	55	7	12	38	0	1	42	53
—	P.M.	5	7	38	6	50	0	1	42	22
—	——	6	54	47	8	37	0	1	42	13
9	Noon	10	17	4	11	58	0	1	40	56
—	P.M.	5	5	38	6	46	0	1	40	22
—	——	6	52	47	8	33	0	1	40	13
10	Noon	10	15	4	11	54	0	1	38	56
—	P.M.	5	29	10	7	7	30	1	38	20
—	——	6	52	47	8	31	0	1	38	13
11	Noon	10	26	5	12	3	0	1	36	55
—	P.M.	4	55	37·5	6	32	0	1	36	22·5
—	——	6	42	46·5	8	19	0	1	36	13·5
12	Noon	9	59	3	11	34	0	1	34	57
—	P.M.	4	51	37·5	6	26	0	1	34	22·5
—	——	6	44	47	8	19	0	1	34	13
	Experiments with Convertible Pendulums.									
19	P.M.	5	33	2·5	6	39	0	1	5	57·5
—	——	6	58	4	8	4	0	1	5	56
20	Noon	10	12	20·5	11	18	0	1	5	39·5
—	P.M.	3	26	26	4	32	0	1	5	34

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Appendix. Table I.—Maranham.

1830.	Time.	Chronom. (929).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
August 20	P.M.	6	41	29·5	7	47	0	1	5	30·5
—	——	7	12	30	8	18	0	1	5	30
21	Noon	10	4	46	11	10	0	1	5	14
—	P.M.	3	27	51·5	4	33	0	1	5	8·5
—	——	5	20	53·5	6	26	0	1	5	6·5
—	——	7	11	55·5	8	17	0	1	5	4·5
22	Noon	10	13	11·5	11	18	0	1	4	48·5
—	P.M.	3	12	16·5	4	17	0	1	4	43·5
—	——	6	55	20·5	8	0	0	1	4	39·5
23	Noon	10	4	37	11	9	0	1	4	23
—	P.M.	3	15	42·5	4	20	0	1	4	17·5
—	——	6	27	46	7	32	0	1	4	14
24	Noon	10	13	2·5	11	17	0	1	3	57·5
—	P.M.	3	26	8	4	30	0	1	3	52
25	Noon	10	1	28·5	11	5	0	1	3	31·5
—	P.M.	3	34	34·5	4	38	0	1	3	25·5
—	——	6	41	38	7	45	0	1	3	22
26	Noon	10	12	55	11	16	0	1	3	5
—	P.M.	3	27	0·5	4	30	0	1	2	59·5
—	——	6	39	4	7	42	0	1	2	56
				Para.						
				For the two Brass Pendulums only.						
September 17	Noon	10	39	8·5	12	9	0	1	29	51·5
—	P.M.	7	54	53·5	9	24	0	1	29	6·5
18	A.M.	3	37	31	5	6	0	1	28	29
—	Noon	10	25	4	11	53	0	1	27	56
—	P.M.	7	20	47·5	8	48	0	1	27	12·5
19	A.M.	2	34	23	4	1	0	1	26	37
—	Noon	10	28	31·5	11	54	30	1	25	58·5
—	P.M.	7	19	44·5	8	45	0	1	25	15·5
20	A.M.	3	21	24	4	46	0	1	24	36
—	Noon	10	25	58·5	11	50	0	1	24	1·5

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Appendix. Table I.—Para.

1830.	Time.	Chronom. (929).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
September 20	Noon	10	31	59	11	56	0	1	24	1
—	P.M.	7	48	14	9	11	30	1	23	16
—	A.M.	3	14	50·5	4	37	30	1	22	39·5
—	Noon	10	31	56	11	54	0	1	22	4
21	——	10	37	56·5	12	0	0	1	22	3·5
—	P.M.	7	39	40·5	9	1	0	1	21	19·5
22	A.M.	2	5	12	3	26	0	1	20	48
—	——	3	12	17·5	4	33	0	1	20	42·5
—	Noon	10	27	53	11	48	0	1	20	7
—	P.M.	7	5	35	8	25	0	1	19	25
23	A.M.	2	6	9·5	3	25	0	1	18	50·5
—	——	3	7	14·5	4	26	0	1	18	45·5
—	Noon	10	15	49·5	11	34	0	1	18	10·5
—	——	10	40	51·5	11	59	0	1	18	8·5
—	P.M.	7	42	5·5	8	59	30	1	17	24·5
24	A.M.	1	59	35·5	3	16	30	1	16	54·5
—	——	3	6	12	4	23	0	1	16	48
—	Noon	10	26	18	11	42	30	1	16	12
—	——	10	38	49	11	55	0	1	16	11
—	P.M.	7	39	3	8	54	30	1	15	27
25	A.M.	3	0	9·5	4	15	0	1	14	50·5
—	Noon	10	13	15	11	27	30	1	14	15
—	——	10	26	16	11	40	30	1	14	14
—	P.M.	7	2	58	8	16	30	1	13	32
26	A.M.	1	55	32	3	8	30	1	12	58
—	——	2	56	7	4	9	0	1	12	53
—	Noon	10	21	13·5	11	33	30	1	12	16·5
—	P.M.	7	14	57	8	26	30	1	11	33
27	A.M.	5	19	17	6	30	0	1	10	43
—	Noon	10	18	41·5	11	29	0	1	10	18·5
—	——	10	31	42·5	11	42	0	1	10	17·5
—	P.M.	6	47	53	7	57	30	1	9	37
28	A.M.	2	46	32·5	3	55	30	1	8	57·5
—	——	2	59	33·5	4	8	30	1	8	56·5

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Appendix. Table I.—Para.

1830.	Time.	Chronom. (929).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
September 28	Noon	10	18	39·5	11	27	0	1	8	20·5
—	——	10	30	40·5	11	39	0	1	8	19·5
	For the Iron and Copper Pendulums only, (*another Clock being used in these comparisons*).									
September 17	Noon	10	45	22·5	11	17	0	0	31	37·5
—	P.M.	7	49	33	8	21	0	0	31	27
18	A.M.	3	28	42	4	0	0	0	31	18
—	Noon	10	44	50·5	11	16	0	0	31	9·5
—	P.M.	7	13	0·5	7	44	0	0	30	59·5
19	A.M.	2	31	9·5	3	2	0	0	30	50·5
—	Noon	10	8	18·5	10	39	0	0	30	41·5
—	——	10	34	19	11	5	0	0	30	41
—	P.M.	7	13	29	7	44	0	0	30	31
20	A.M.	3	24	39	3	55	0	0	30	21
—	Noon	10	12	47	10	43	0	0	30	13
—	——	10	35	47·5	11	6	0	0	30	12·5
—	P.M.	7	44	58	8	15	0	0	30	2
21	A.M.	3	11	7	3	41	0	0	29	53
—	Noon	10	46	16	11	16	0	0	29	44
—	P.M.	7	52	26·5	8	22	0	0	29	33·5
22	A.M.	2	0	34	2	30	0	0	29	26
—	——	3	17	35·5	3	47	0	0	29	24·5
—	Noon	9	56	43·5	10	26	0	0	29	16·5
—	——	10	22	44	10	52	0	0	29	16
—	P.M.	6	58	54	7	28	0	0	29	6
23	A.M.	3	5	4	3	34	0	0	28	56
—	Noon	10	29	13	10	58	0	0	28	47
—	P.M.	7	52	24	8	21	0	0	28	36
24	A.M.	1	58	31·5	2	27	0	0	28	28·5
—	——	3	11	33	3	40	0	0	28	27
—	Noon	10	14	41·5	10	43	0	0	28	18·5
—	P.M.	7	32	52·5	8	1	0	0	28	7·5
25	A.M.	3	3	2	3	31	0	0	27	58
—	Noon	9	35	10	10	3	0	0	27	50

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APPENDIX. TABLE I.—Para.

1830.	Time.	Chronom. (929). h m s	Clock. h m s	Difference. h m s
September 25	Noon	10 25 11	10 53 0	0 27 49
			Clock wound up.	
—	P.M.	6 59 21	7 27 0	0 27 39
26	A.M.	1 54 29·5	2 22 0	0 27 30·5
—	——	3 9 31	3 37 0	0 27 29
—	Noon	10 14 39·5	10 42 0	0 27 20·5
—	P.M.	7 13 50	7 41 0	0 27 10
27	A.M.	5 32 3	5 59 0	0 26 57
—	Noon	10 5 8·5	10 32 0	0 26 51·5
—	——	10 30 9	10 57 0	0 26 51
—	P.M.	6 55 19	7 22 0	0 26 41
28	A.M.	3 0 29	3 27 0	0 26 31
—	Noon	10 26 38	10 53 0	0 26 22
29	A.M.	5 34 1·5	6 0 0	0 25 58·5
—	Noon	10 11 7	10 37 0	0 25 53
—	——	11 3 8	11 29 0	0 25 52
—	P.M.	7 50 18·5	8 16 0	0 25 41·5
30	A.M.	4 47 29·5	5 13 0	0 25 30·5
—	Noon	9 52 35·5	10 18 0	0 25 24·5
—	——	10 17 36	10 43 0	0 25 24
—	P.M.	7 55 47·5	8 21 0	0 25 12·5
October 1	A.M.	2 41 56	3 7 0	0 25 4
—	Noon	10 56 6	11 21 0	0 24 54
		Trinidad.		
November 10	Noon	11 24 9	11 48 0	0 23 51
—	P.M.	10 43 32·5	11 6 30	0 22 57·5
—	——	12 5 9	12 28 0	0 22 51
—	——	12 11 9·5	12 34 0	0 22 50·5
11	Noon	11 37 33·5	11 59 30	0 21 56·5
—	P.M.	10 49 56·5	11 11 0	0 21 3·5
—	——	11 54 1·5	12 15 0	0 20 58·5
12	Noon	10 52 53·5	11 13 0	0 20 6·5

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Appendix. Table I.—Trinidad.

1830.	Time.	Chronom. (929).			Clock. Shelton.			Difference.		
		h	m	s	h	m	s	h	m	s
November 12	Noon	11	24	56	11	45	0	0	20	4
—	P.M.	10	39	49	10	59	0	0	19	11
—	——	11	54	55	12	14	0	0	19	5
13	Noon	11	21	49	11	40	0	0	18	11
—	P.M.	10	41	42·5	10	59	0	0	17	17·5
—	——	11	49	48	12	7	0	0	17	12
14	Noon	10	58	10·5	11	14	30	0	16	19·5
—	——	11	17	42	11	34	0	0	16	18
—	P.M.	10	50	36·5	11	6	0	0	15	23·5
—	Midn^{t}.	11	46	41	12	2	0	0	15	19
15	Noon	10	57	33·5	11	12	0	0	14	26·5
—	——	11	23	35·5	11	38	0	0	14	24·5
—	P.M.	10	37	28·5	10	51	0	0	13	31·5
16	Noon	10	32	24·5	10	45	0	0	12	35·5
—	——	11	23	58·5	11	36	30	0	12	31·5
—	P.M.	10	19	20	10	31	0	0	11	40
—	——	11	34	56	11	46	30	0	11	34
17	Noon	11	24	21·5	11	35	0	0	10	38·5
—	P.M.	10	15	42·5	10	25	30	0	9	47·5
—	——	11	31	18·5	11	41	0	0	9	41·5
18	Noon	10	54	42	11	3	30	0	8	48
—	——	11	26	44·5	11	25	30	0	8	45·5
—	P.M.	10	16	35·5	10	24	30	0	7	54·5
—	——	11	25	41	11	33	30	0	7	49
19	Noon	11	1	35·5	11	8	30	0	6	54·5
—	——	11	27	7·5	11	34	0	0	6	52·5
—	P.M.	10	11	28	10	17	30	0	6	2
—	——	11	27	4	11	33	0	0	5	56
20	Noon	11	8	59	11	14	0	0	5	1
—	P.M.	10	11	51	10	16	0	0	4	9
—	——	11	14	56	11	19	0	0	4	4
21	P.M.	10	0	13	10	2	30	0	2	17
—	——	11	16	19	11	18	30	0	2	11

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APPENDIX. TABLE I.—Trinidad.

1830.	Time.	Clock. SHELTON.			Clock. GRAHAM ?			Difference.		
		Comparison of the Clocks with each other.								
		h	m	s	h	m	s	h	m	s
November 10	P.M.	0	42	0	0	46	43	0	4	43
—	——	11	8	0	11	13	32	0	5	32
—	Midn^{t}.	12	36	0	12	41	39	0	5	39
11	A.M.	6	33	30	6	39	37	0	6	7
—	Noon	0	30	25	0	37	0	0	6	35
—	P.M.	5	24	30	5	31	28	0	6	58
—	Midn^{t}.	0	26	0	0	33	31	0	7	31
12	A.M.	6	11	0	6	18	58	0	7	58
—	——	8	19	0	8	27	8	0	8	8
—	Noon	11	43	6	11	51	30	0	8	24
—	P.M.	5	4	0	5	12	49	0	8	49
—	——	12	20	0	12	29	23	0	9	23
13	A.M.	9	6	0	9	16	4	0	10	4
—	Noon	11	15	0	11	25	14	0	10	14
—	P.M.	4	49	0	4	59	40	0	10	40
—	——	12	7	0	12	18	14	0	11	14
14	A.M.	6	7	0	6	18	42	0	11	42
—	Noon	11	3	0	11	15	5	0	12	5
—	P.M.	4	51	0	5	3	32	0	12	32
—	Midn^{t}.	0	9	30	0	22	36	0	13	6
15	A.M.	6	12	30	6	26	4	0	13	34
—	Noon	11	35	0	11	48	59	0	13	59
—	P.M.	4	59	0	5	13	24	0	14	24
—	——	11	25	30	11	40	24	0	14	54
16	A.M.	6	45	0	7	0	28	0	15	28
—	Noon	11	5	0	11	20	48	0	15	48
—	P.M.	4	53	30	5	9	45	0	16	15
					Clock wound up.					
—	Midn^{t}.	11	47	30	12	4	17	0	16	47
17	A.M.	6	4	0	6	21	16	0	17	16
—	Noon	11	54	30	12	12	13	0	17	43
—	Midn^{t}.	11	51	0	12	9	38	0	18	38
18	A.M.	6	22	30	6	41	38	0	19	8

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Appendix. Table I.—Trinidad.

1830.	Time.	Clock. Shelton.			Clock. Graham?			Difference.		
		h	m	s	h	m	s	h	m	s
November 18	Noon	11	36	0	11	55	32	0	19	32
—	P.M.	5	2	0	5	21	57	0	19	57
—	Midn^t.	11	47	30	12	7	58	0	20	28
19	A.M.	6	19	30	6	40	28	0	20	58
—	Noon	11	47	0	12	8	23	0	21	23
—	P.M.	5	14	42	5	36	30	0	21	48
—	——	11	35	0	11	57	17	0	22	17
20	A.M.	6	21	0	6	43	48	0	22	48
—	Noon	11	36	30	11	59	42	0	23	12
—	P.M.	11	26	0	11	50	6	0	24	6
21	Noon	11	15	0	11	40	0	0	25	0
—	P.M.	4	43	30	5	8	55	0	25	25
—	——	11	18	30	11	44	25	0	25	55

APPENDIX. TABLE I.—Porto Bello.

1831.	Time.	Chronom. (929).			Clock.			Difference.		
		h	m	s	h	m	s	h	m	s
January 1	P.M.	10	43	13·5	9	40	0	1	3	13·5
2	——	10	21	2	9	16	0	1	5	2
—	——	11	39	38	10	34	30	1	5	8
—	——	12	25	11·5	11	20	0	1	5	11·5
3	Noon	12	44	8	11	38	0	1	6	8
—	P.M.	10	22	22	9	15	30	1	6	52
—	——	11	40	28	10	33	30	1	6	58
4	Noon	12	35	57·5	11	28	0	1	7	57·5
—	P.M.	10	51	14·5	9	42	30	1	8	44·5
—	——	11	30	17·5	10	21	30	1	8	47·5
—	——	12	22	21·5	11	13	30	1	8	51·5
5	Noon	12	31	17·5	11	21	30	1	9	47·5
—	P.M.	10	12	2	9	1	30	1	10	32
—	——	11	31	8	10	20	30	1	10	38
—	——	12	16	41·5	11	6	0	1	10	41·5
6	Noon	12	36	38	11	25	0	1	11	38
—	——	13	2	10	11	50	30	1	11	40
—	P.M.	10	3	51·5	8	51	30	1	12	21·5
—	——	11	28	28	10	16	0	1	12	28
—	——	12	14	1·5	11	1	30	1	12	31·5
7	Noon	12	44	29	11	31	0	1	13	29
—	——	13	3	30·5	11	50	0	1	13	30·5

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TABLE II.—Observed Transits.

Monte Video.

1828.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chronom.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
August 25	ζ Aquilæ	19 48	20 17·5	11 20 45·5	21 14	21 41	11 20 45·25	2 39 30·06	8 41 15·19
P.M.	δ „	39 6	39 33·5	11 40 1	40 28	40 55·5	11 40 0·83	2 39 30·22	9 0 30·61
—	γ „	0 16·5	0 45	12 1 12·5	1 40	2 8	12 1 12·42	2 39 30·40	9 21 42·02
—	α „	4 35	5 3·5	12 5 30·5	5 58	6 26	12 5 30·58	2 39 30·43	9 26 0·15
—	β „	9 2·5	9 31	12 9 58	10 26	10 53	12 9 58·08	2 39 30·46	9 30 27·62
—	α^2 Capricorni..	.....	31 4·5	12 31 32	32 0·5	32 28	12 31 32·25	2 39 30·61	9 52 1·64
26	⊙'s 1st Limb	39 13·5	39 42·2	2 40 10·2	40 38	41 6	2 41 14·64	2 39 37·75	0 1 36·89
	⊙'s 2d Limb	41 23	41 51·5	2 42 19·3	42 47·5	43 15			
P.M.	No Observations	this evening,	sky densely	clouded, fresh	gale from S. E.				
27	⊙'s 1st Limb	38 21·5	38 50·2	2 39 17·7	39 45·5	40 13·2	2 40 22·11	2 39 49·75	0 0 32·36
	⊙'s 2d Limb	40 30	40 59	2 41 27	41 54·5	42 22			
	No Observations	this evening,	heavy gale	from S.E.,	with rain.				
P.M.	Antares	.....	.....	.....	34 4	.....	8 33 33·85	2 39 52·57	5 53 41·28
30	⊙'s 1st Limb	35 40	36 9	2 36 36·8	37 4·5	37 32	2 37 41·72	2 40 25·05	11 57 16·67
	⊙'s 2d Limb	37 49·5	38 17·5	38 50·5	39 13	39 40·5			
P.M.	Antares	.....	.....	.....	20 29·5	21 0	8 19 59·23	2 40 27·91	5 39 31·32
—	α Herculis....	.....	7 17·5	9 7 45·8	8 14	8 42	9 7 45·78	2 40 28·21	6 27 17·47
—	α Ophiuchi ...	26 53·5	27 22·5	9 27 50·5	28 18·5	28 46	9 27 50·25	2 40 28·37	6 47 21·88
—	β „ ...	.....	.....	9 35 50·5	36 18	36 45	9 35 50·47	2 40 28·43	6 55 22·04
—	γ „ ...	.....	39 40	9 40 7	40 34·5	41 1·5	9 40 7·12	2 40 28·45	6 59 38·67
—	α Lyræ.....	.....	.....	.....	32 23·5	32 58	10 31 48·36	2 40 28 78	7 51 19·58
—	β „	43 16·5	43 50	10 44 22·5	44 55	45 27·5	10 44 22·33	2 40 28·85	8 3 53·48
—	ξ Sagit.	.....	.....	.....	52 50	53 20·5	10 52 17·49	2 40 28·90	8 11 48·59
—	ζ Aquilæ	57 9·5	57 38·5	10 58 6·5	58 34·5	59 2·5	10 58 6·33	2 40 28·94	8 17 37·39
—	δ „	16 26·8	16 55	11 17 22·5	17 49·5	18 16·5	11 17 22·13	2 40 29·07	8 36 53·06
—	γ „	37 38	38 6·5	11 38 33·5	39 1	39 28·5	11 38 33·50	2 40 29·27	8 58 4·23

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APPENDIX. *TABLE II.—Monte Video.*

August 30	α Aquilæ	41 55	42 24	11 42 51	43 18·5	43 45·5	11 42 50·83	2 40 29·31	9 2 21·52
P.M.	β "	46 23	46 51·5	11 47 18·5	47 46	48 13	11 47 18·42	2 40 29·36	9 6 49·06
—	α^2 Capricorni ..	7 56	8 25	12 8 53·8	9 21·5	9 49	12 8 53·18	2 40 29·59	9 28 23·59
—	α Cygni	34 34·5	35 14	12 35 53	36 31	37 9	12 35 52·42	2 40 29·84	9 55 22·58
		During this	evening's ob	servations the	Eastern end	of the Axis	was 4 div.=8″	too high.	
31	⊙'s {1st Limb	34 45·5	35 14	2 35 41·5	36 9·5	36 36·5	2 36 45·75	2 40 37·13	11 56 8·62
Noon	⊙'s {2d Limb	36 54	37 22·5	2 37 50	38 18	38 46			
P.M.	Antares	.....	.....	8 15 27	15 57	16 27·5	8 15 26·82	2 40 39·98	5 34 46·84
—	α Herculis	2 16	2 44·5	9 3 13	3 41·5	4 9·5	9 3 12·92	2 40 40·36	6 22 32·56
—	α Ophiuchi....	22 22	22 51	9 23 18·5	23 46	24 13·5	9 23 18·25	2 40 40·52	6 42 37·73
—	β " ...	30 23·5	30 51·5	9 31 19	31 45·5	32 13·5	9 31 18·67	2 40 40·58	6 50 38·09
—	γ " ...	.....	.....	9 35 36	36 3	36 30	9 35 35·7	2 40 40·69	6 54 55·01
—	α Lyræ.....	26 5·5	26 41	10 27 16·5	27 51·5	28 25·5	10 27 16·08	2 40 41·04	7 46 35·04
—	β "	38 45	39 17·5	10 39 50·5	40 23	40 56	10 39 50·42	2 40 41·14	7 59 9·28
—	ζ Sagit.	.....	47 15	10 47 46	48 17·5	48 49	10 47 46·12	2 40 41·21	8 7 4·91
—	ζ Aquilæ	52 38	53 6·5	10 53 34·5	54 3	54 30·5	10 53 34·5	2 40 41·26	8 12 53·24
—	ε "	11 55	12 23·5	11 12 50·5	13 18	13 45	11 12 50·42	2 40 41·39	8 32 9·03
—	γ "	33 5	33 34·5	11 34 2	34 29·5	34 57·5	11 34 1·75	2 40 41·63	8 53 20·12
—	α "	37 24	37 52·5	11 38 20	38 47·5	39 14·5	11 38 19·75	2 40 41·67	8 57 38·08
—	β "	41 51·5	42 20	11 42 47	43 14·5	43 42	11 42 47	2 40 41·71	9 2 5·29
—	α^2 Capricorni ..	3 24·5	3 54	12 4 22	4 50	5 17·5	12 4 21·67	2 40 41·93	9 23 39·74
—	α Cygni	30 3·5	30 42	12 31 21	31 59	32 37·5	12 31 20·67	2 40 42·14	9 50 38·53
September 1	⊙'s {1st Limb	33 52	34 20·5	2 34 48	35 15·7	35 43·5	2 35 52·14	2 40 49·17	11 55 2·97
Noon	⊙'s {2d Limb	36 0·5	36 29	2 36 56·5	37 24	37 51·5			
P.M.	α Herculis	57 45	58 13·5	8 58 42	59 10	59 38	8 58 41·75	2 40 52·36	6 17 49·39
—	α Ophiuchi ...	17 50	18 19	9 18 47	19 14·5	19 42·5	9 18 46·67	2 40 52·56	6 37 54·11
—	β " ...	25 51·5	26 20	9 26 47	27 14·5	27 42	9 26 47	2 40 52·61	6 45 54·39
—	γ " ...	30 8·5	30 36·5	9 31 3·5	31 31·5	31 58·5	9 31 3·67	2 40 52·64	6 50 11·03
—	α Lyræ.....	21 34	22 10·5	10 22 45·5	23 20	23 54·5	10 22 45	2 40 53·08	7 41 51·92
—	β "	34 13	34 47	10 35 19·5	35 52	36 24·5	10 35 19·25	2 40 53·18	7 54 26·07
—	ζ Sagit.	.....	42 43	10 43 14·5	43 45	44 17	10 43 14·25	2 40 53·25	8 2 21
—	ζ Aquilæ	48 6·5	48 35·5	10 49 3·5	49 31·5	49 59·5	10 49 3·33	2 40 53·3	8 8 10·03

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1828.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
September 1	δ Aquilæ	7 23·5	7 52	11 8 19	8 45·5	9 13	11 8 18·67	2 40 53·46	8 27 25·21
P.M.	γ „	28 34·5	29 2·5	11 29 31	29 58	30 26	11 29 30·5	2 40 53·64	8 48 36·86
—	α „	32 52	33 20·5	11 33 48	34 16	34 43·5	11 33 48	2 40 53·67	8 52 54·33
—	β „	37 20	37 48	11 38 15·5	38 43·5	39 10·5	11 38 15·5	2 40 53·71	8 57 21·79
—	α^2 Capricorni ..	58 53	59 22·5	11 59 50·5	9 19·5	0 46·5	11 59 50·42	2 40 53·89	9 18 56·53
—	α Cygni	25 31·5	26 11	12 26 50	27 21	28 6·5	12 26 49·5	2 40 54·11	9 46 55·39
2	In the early part of the evening of the 2nd, the wind was fresh from N.E., the sky partially clouded, and the stars very tremulous; so much so, that those stars previous to δ Aquilæ could not be satisfactorily observed.								
P.M.	δ Aquilæ	2 53	3 21	11 3 48·5	4 15·5	4 43	11 3 48·25	2 41 5·46	8 22 42·79
—	γ „	24 3	24 32	11 25 0	25 27·5	Clouded	11 24 59·87	2 41 5·64	8 43 54·23
—	α „	28 21	28 50	11 29 17·5	29 45·5	30 12	11 29 17·25	2 41 5·68	8 48 11·57
—	β „	32 49	33 17·5	11 33 45	34 12·5	34 39·5	11 33 44·75	2 41 5·71	8 52 39·04
—	α^2 Capricorni ..	.....	54 51·5	11 55 19·5	55 48	.....	11 55 19·62	2 41 5·89	9 14 13·73
—	α Cygni	21 1	21 41	12 22 19	22 57·5	23 35·5	12 22 18·83	2 41 6·12	9 41 12·71
3	⊙'s 1st Limb	32 2·5	32 31	2 32 58·5	33 26	33 54	2 34 2·68	2 41 13·07	11 52 49·61
	⊙'s 2d Limb	34 11	34 39·5	2 35 7	35 35	36 2·2			
P.M.	α Herculis	48 42·5	49 11·5	8 49 40	50 8	50 36	8 49 39·67	2 41 16·13	6 8 23·54
—	α Ophiuchi ...	8 48·5	9 17	9 9 45	10 13	10 41	9 9 44·92	2 41 16·29	6 28 28·63
—	β „ ...	16 49·5	17 18	9 17 45·2	18 12·5	18 40	9 17 45·04	2 41 16·35	6 36 28·69
—	γ „ ...	21 6·5	21 34·5	9 22 2	22 29·5	22 56·5	9 22 1·83	2 41 16·39	6 40 45·44
—	α Lyræ.....	12 31	13 7	10 13 42	14 17	14 51·5	10 13 41·75	2 41 16·80	7 32 24·95
—	ζ Aquilæ	39 4	39 33	10 40 1	40 29	40 57	10 40 0·83	2 41 17·02	7 58 43·81
—	δ „	.....	58 49·5	10 59 17	59 44·5	0 11·5	10 59 17	2 41 17·17	8 17 59·83
—	α „	23 50·2	24 18·8	11 24 46·5	25 14	25 41·2	11 24 46·2	2 41 17·37	8 43 28·83
—	α^2 Capricorni ..	.....	50 20·5	11 50 48·5	51 17	51 44·2	11 50 48·67	2 41 17·57	9 9 31·10
4	α Herculis	44 11·5	44 40·5	8 45 8	45 37	46 5	8 45 8·50	2 41 28·16	6 3 40·34
P.M.	α Ophiuchi ...	4 17	4 45·5	9 5 14	5 42	6 9·5	9 5 13·67	2 41 28·32	6 23 45·35
—	β „ ...	12 18	12 46·5	9 13 14	13 41	14 8·5	9 13 13·67	2 41 28·38	6 31 45·29
—	γ „ ...	16 35	17 3·5	9 17 30·5	17 58	18 25	9 17 30·42	2 41 28·41	6 36 2·01
—	α Lyræ	8 1	8 36·5	10 9 11·5	9 46·5	10 21	10 9 11·33	2 41 28·83	7 27 42·50

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APPENDIX. TABLE II.—Monte Video.

—	β „	20 40	21 13	10 21 46	22 18·5	22 51	10 21 45·75	2 41 28·93	7 40 16·82
—	ζ Aquilæ	34 33	35 2	10 35 30	35 59	36 26	10 35 30	2 41 29·04	7 54 0·96
—	δ „	53 50·5	54 18·2	10 54 45·5	55 13	55 40·5	10 54 45·53	2 41 29·19	8 13 16·34
—	γ „	15 1	15 29·5	11 15 57	16 25	16 52·5	11 15 57	2 41 29·36	8 34 27·64
—	α „	19 18·5	19 47	11 20 15	20 42·5	21 10	11 20 14·67	2 41 29·39	8 38 45·28
—	β „	23 46·5	24 15	11 24 42·5	25 10	25 37	11 24 42·25	2 41 29·43	8 43 12·82
—	α^3 Capricorni ..	45 20	45 49·5	11 46 17	46 45	47 13	11 46 16·92	2 41 29·62	9 4 47·3
—	α Cygni	11 58·5	12 38	12 13 16·5	13 54·5	14 32·8	12 13 16·14	2 41 29·84	9 31 46·3
5	α Herculis	39 39·3	40 8·5	8 40 37	41 5·5	41 33·5	8 40 36·8	2 41 39·53	5 58 56·27
P.M.	α Ophiuchi ...	59 45	0 14	9 0 41·8	1 10	1 38	9 0 41·5	2 41 39·69	6 19 1·81
—	β „ ...	7 46·2	8 14·5	9 8 42	9 9	9 36·5	9 8 41·7	2 41 39·75	6 27 1·95
—	γ „ ...	.....	12 31·5	9 12 59	13 26·5	13 53·6	9 12 59	2 41 39·79	6 31 19·21
—	ζ Aquilæ	30 2	30 30·5	10 30 59	31 27	31 54·5	10 30 58·67	2 41 40·41	7 49 18·26
—	δ „	49 19	49 47·5	10 50 15	50 42·5	51 9·2	10 50 14·70	2 41 40·57	8 8 34·13
—	γ „	10 29·5	10 58·5	11 11 26	11 54	12 21·5	11 11 25·92	2 41 40·74	8 29 45·18
—	α „	14 47·5	15 16·5	11 15 44	16 11·5	16 39	11 15 43·75	2 41 40·77	8 34 2·98
—	β „	19 15·5	19 44	11 20 11·5	20 39	21 6·5	11 20 11·33	2 41 40·81	8 38 20·52
—	α^3 Capricorni ..	40 49	41 17·5	11 41 46	42 14	42 42	11 41 45·75	2 41 40·98	9 0 4·77
6	α Herculis	.....	.....	8 36 6	36 34·5	37 2·5	8 36 6	2 41 50·97	5 54 15·03
P.M.	α Ophiuchi ...	.....	55 43·5	8 56 11·5	56 39·5	57 7	8 56 11·5	2 41 51·14	6 14 20·36
—	α Lyræ.....	58 59	59 34·5	10 0 11	.....	.....	10 0 11	2 41 51·66	7 18 19·34
—	β „	.....	12 11·5	10 12 44·5	13 17	13 49	10 12 44·37	2 41 51·76	7 30 52·61
—	ζ Aquilæ	25 30·5	.....	10 26 27·5	26 55·5	27 23·5	10 26 27·25	2 41 51·87	7 44 35·38
—	δ „	44 48	45 16	10 45 43·5	46 11	46 38	10 45 43·33	2 41 52·02	8 3 51·31
—	γ „	5 58·5	6 27	11 6 55	7 22·5	7 50·5	11 6 54·75	2 41 52·19	8 25 2·56
—	α „	10 16·5	10 45	11 11 12·5	11 40·5	12 7·5	11 11 12·42	2 41 52·22	8 29 20·20
—	β „	14 44·5	15 13	11 15 40·5	16 7·5	16 35	11 15 40·17	2 41 52·26	8 33 47·91
—	α^3 Capricorni ..	36 18	36 47	11 37 15	37 43	38 11	11 37 14·83	2 41 52·43	8 55 22·40
—	α Cygni	2 56	3 35·5	12 4 14·5	4 52·5	5 30·5	12 4 13·92	2 41 52·56	9 22 21·36
7	α Herculis	.....	31 6·5	8 31 35·5	.....	.....	8 31 35·5	2 42 2·45	5 49 33·05
P.M.	α Ophiuchi ...	.....	.....	8 51 40·5	52 8·5	52 37	8 51 40·5	2 42 2·61	6 9 37·89
—	β „ ...	.....	59 13	8 59 40·5	.....	.....	8 59 40·5	2 42 2·67	6 17 37·83

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1828.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
September 7	γ Ophiuchi ...	3 1·5	3 29·5	9 3 57	.....	.....	9 3 57	2 42 2·71	6 21 54·29
P.M.	β Lyræ.....	7 6·5	7 40·5	10 8 13	8 45·5	9 17·8	10 8 12·88	2 42 3·26	7 26 9·62
—	ζ Aquilæ	21 0	21 28·5	10 21 57	22 25	22 53	10 21 56·75	2 42 3·37	7 39 53·38
—	γ „	1 27·5	1 56	11 2 24	2 52	3 19·5	11 2 23·83	2 42 3·69	8 20 20·14
—	α „	5 45·5	6 14	11 6 42	7 9·5	7 37	11 6 41·67	2 42 3·72	8 24 37·95
—	β „	10 13·5	10 42	11 11 10	11 37	12 4·5*	11 11 9·5	2 42 3·76	8 29 5·74
—	At $9^h\ 54^m\ 41^s·5$ the emersion of Jupiter's second satellite was observed.								
			Times of observation by Chron. 799 for Longitude, &c.						
15	Antares	22 46·2	23 17·8	8 23 47·8	24 18·1	34 48·6	8 23 47·72		
—	☾'s 1st Limb..	33 49·5	34 19·2	8 34 48·6	35 18·3	35 47·3	8 34 48·58		
—	P.M. at Rat Is by 799, the land observed the immersion of a small Star of about 6th Mag. on the Moon's dark limb at 1^h comparison of which with 167 at $2^h 27^m$ $54^s·8$ was — $16^m\ 54^s·8$								$59^m\ 53^s·5$
17	Antares	.....	.....	.....	16 26·5	16 56	8 15 55·72		
—	☽'s 1st Limb..	31 20	31 50	10 26 53·8	.....	27 55·8	10 26·53·85		
—	The occultation of A.S.C. 215 1 Clypei Sob by the Moon was observed to take place at $11^h\ 14^m\ 11^s·2$ by 799.								
18	p′ Sagittarii ...	3 25·4	3 53·8	11 4 22·5	4 50·5	5 18·8	11 4 22·25		
—	☽'s 1st Limb .	23 31	24 0·2	11 24 29·2	Too great glare.	25 29·2	11 24 29·65		
—	α^2 Capricorni..	0 7	0 35·8	12 1 3·2	1 31	1 59	12 1 3·2		
20	α^2 Capricorni..	52 15	52 43·2	11 53 11·7	53 39·8	54 7·6	11 53 11·5		
—	α Cygni	18 53·2	19 33·5	12 20 12	20 49·8	21 28·4	12 20 11·48		
—	ν Aquarii	43 49·2	44 18·5	12 44 46	45 14·5	Clouded.	12 44.46·25		
—	y^2 „	59 32·4	0 1	1 0 28·8	0 55·8	Clouded.	1 0 28·6		
—	☽'s 1st Limb..	17 48·2	18 17·8	1 18 46	19 15	19 42·5	1 18 46·2		
—	α Aquarii	Clouded.	40 53·2	1 41 21·2	41 47·8	42 15·3	1 41 20·85		
—	θ „	51 11·6	51 39·4	1 52 7·6	52 34·8	53 1·8	1 52 7·13		
22	1st 61 Cygni ..	34 44·6	35 20	12 35 54·4	36 29·2	37 3·8	12 35 54·4		
—	β Aquarii	58 13·4	58 41·4	12 59 9·3	59 36·4	60 3·4	12 59 8·87		
—	α „	32 35·2	33 3	1 33 30·4	33 57·4	34 25	1 33 30·23		
—	w′ Piscium....	56 1	56 30	2 56 57·2	57 25	57 51·3	2 56 56·95		

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—	w^4 Piscium	0 41·3	1 10	3 1 37·2	2 4·8	2 32	3 1 37·08		
—	☽'s 1st Limb .	8 9	8 37·6	3 9 5·5	9 33·8	10 1·6	3 9 5·5		
—	☽'s 2d Limb .	10 25·5	10 54·6	3 11 22·5	11 50·5	12 18	3 11 22·22		

Staten Island.

November 3	⊙'s 1st Limb	12 39·5	13 8·5	2 13 37	14 5·5	14 33·7	2 14 43·97	2 11 35·6	0 3 8·37
	⊙'s 2d Limb	14 54	15 23	2 15 51·2	16 19	16 48			
P.M.	∂ Aquarii	.....	.....	10 23 32	24 0	24 29	10 23 31·85	2 11 11·9	8 12 19·95
—	Fomalhaut	25 4	25 36·5	10 26 8·5	26 40	27 12	10 26 8·25	2 11 11·75	8 14 56·50
—	ϕ Aquarii	42 26·5	42 54·5	10 43 22	43 49·5	44 17·2	10 43 21·95	2 11 10·89	8 32 11·06
—	γ Pegasi	.....	41 42	11 42 10·5	42 38·5	43 7	11 42 10·37	2 11 8	9 31 2·37
—	8 Ceti.....	47·29	47 57·5	11 48 25·5	48 53	49 21	11 48 25·28	2 11 7·70	9 37 17·58
—	β „	.....	12 9·5	12 12 38·5	13 7	13 36	12 12 38·37	2 11 6·67	10 1 31·70
—	45 „	52 3	52 31	12 52 59	53 26	53 54·5	12 52 58·75	2 11 5·34	10 41 53·41
4	⊙'s 1st Limb	12 5	12 34·5	2 13 2·5	13 31	13 59·5	2 14 9·62	2 10 25·15	0 3 44·47
	⊙'s 2d Limb	14 19·5	14 48·5	2 15 17	15 45	16 13·5			
	No observations this evening; the sky densely overcast, and constant rain from $8^h\ 30^m$ P.M. until 2^h A.M. 5th.								
5	⊙'s 1st Limb	.....	.....	2 12 33	13 1	13 28·5	2 13 40·25	2 9 15·07	0 4 25·18
	⊙'s 2d Limb	13 49	.....	2 14 48	15 15	15 44			
	No observations this evening; the sky overcast, and small rain occasionally.								
6	⊙'s 1st Limb	11 3·5	11 33	2 12 2	12 30	12 58·5	2 13 8·79	2 8 4·83	0 5 3·96
	⊙'s 2d Limb	13 18·5	13 48	2 14 16·5	14 44·5	15 12·5			
	No observations this evening; sky wholly overcast, with rain at intervals.								
7	Sun obscured at time of passing the meridian, and no stars observed this evening, there being a gale of wind from the W.S.W. and much rain.								
8	Sun obscured; strong westerly winds, and rainy weather.								
9	Sun obscured; fresh winds from the westward, and thick cloudy weather; no stars observed either this evening; much rain during the night.								
10	⊙'s 1st Limb	.....	.....	.....	10 35·5	11 4	2 11 14·47	2 3 24·25	0 7 50·22
	⊙'s 2d Limb	11 24·5	11 53·5	2 12 22·7	12 51	13 19·5			
P.M.	Fomalhaut	53 38	54 10·5	9 54 42·5	55 14	55 45·8	9 54 42·22	2 3 1·62	7 51 40·60

* Star nearly obscured by haze, when passing the fifth Wire.

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1823.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
Nov. 10	2 Ceti.....	0 18·5	0 48·5	11 1 17·5	1 46	2 15	11 1 17·17	2 2 58·63	8 58 18·54
P.M.	γ Pegasi	9 47	10 16	11 10 44·5	11 12·5	11 41	11 10 44·25	2 2 58·16	9 7 46·09
—	8 Ceti.....	.....	16 31·5	11 16 59·5	17 26·5	17 55	11 16 59·25	2 2 57·85	9 14 1·4
—	β „	40 13·5	40 43	11 41 12	41 40·5	.....	11 41 11·87	2 2 56·64	9 38 15·23
—	η „	.....	.....	.....	6 34	7 2·5	12 6 6·56	2 2 55·45	10 3 11·11
—	θ „	.....	21 5·5	12 21 33	22 0·5	22 28·0	12 21 33	2 2 54·72	10 18 38·28
—	τ „	41 10	41 38·5	12 — —	42 36·5	43 5	12 42 7·5	2 2 53·69	10 39 13·81
—	ζ „	.....	.....	.....	49 28	49 56·5	12 49 0·54	2 2 53·39	10 46 7·15
11	First Series concluded here, and the Transit Instrument removed, that the found owing to the heavy rains, might be rendered more stable. Sun not observed, the Instrument not being replaced.						ation of the Pedestal which had given way,		
—	Fomalhaut....	49 8·5	49 41	9 50 13·0	50 44·5	51 16·5	9 50 12·75	2 1 51·98	7 48 20·77
12 Noon	⊙'s 1st Limb	.....	.....	2 9 14·5	9 42·5	10 12	2 10 22·36	2 1 4·83	0 9 17·53
	⊙'s 2d Limb	.....	11 1·5	2 11 30·5	11 59	12 27·2			
P.M.	☽'s 1st Limb .	52 31	53 0·8	6 53 30·2	53 59	54 28·5	6 53 29·95	2 0 50·64	4 52 39·31
—	Fomalhaut....	44 39	45 12	9 45 43·5	46 15	46 47	9 45 43·33	2 0 42·30	7 45 1·03
—	2 Ceti.....	51 21	51 50·5	10 52 19·5	52 48	53 16·5	10 52 19·17	2 0 39·05	8 51 40·12
—	γ Pegasi	0 49	1 17	11 1 46·5	2 13·5	2 42	11 1 45·75	2 0 38·58	9 1 7·17
—	8 Ceti.....	7 4·5	7 32·5	11 8 0·5	8 27·5	8 56	11 8 0·25	2 0 38·27	9 7 21·98
—	β „	31 15	31 44·5	.....	.....	33 11·5	11 32 13·25	2 0 37·12	9 31 36·13
—	η „	.....	.....	11 57 8	.....	58 4	11 57 8	2 0 35·88	9 56 32·12
—	θ „	.....	12 7	12 12 34·5	13 2·5	13 30	12 12 34·62	2 0 35·15	10 11 59·47
—	τ „	32 11·5	32 41	12 33 10	33 38	34 7	12 33 9·58	2 0 34·13	10 32 35·45
—	ζ „	.....	.....	12 40 2·5	40 30	40 58	12 40 2·5	2 0 33·82	10 39 28·68
13 Noon	⊙'s 1st Limb	7 52	8 21·5	2 8 50	9 18·5	9 47·5	2 9 57·92	1 59 54·5	0 10 3·42
	⊙'s 2d Limb	10 7·5	.....	2 11 6·2	11 35	12 4			
P.M.	☽'s 1st Limb .	47 6·5	47 36	7 48 4·7	48 33·5	49 2	7 48 4·75	1 59 38·05	5 48 26·7
—	Fomalhaut....	40 10	40 42·5	9 41 14·5	41 46	42 17·7	9 41 14·20	1 59 32·55	7 41 41·65
—	2 Ceti.....	46 51·5	47 20·8	10 47 49·5	48 18	48 47·2	10 47 49·42	1 59 29·25	8 48 20·17
—	γ Pegasi	56 19	56 48	10 57 16·5	57 44·5	58 12·8	10 57 16·22	1 59 28·78	8 57 47·44
—	8 Ceti	2 35	3 3·5	11 3 31·5	3 59	4 26·5	11 3 31·17	1 59 28·48	9 4 2·69

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—	β Ceti	26 45·5	27 15	11 27 44·5	28 13	28 41	11 27 43·80	1 59 27·32	9 28 16·48
—	η „	51 42·5	52 11	11 52 39	53 6·5	53 34·5	11 52 38·75	1 59 26·12	9 53 12·63
—	θ „	7 9·5	7 38	12 8 5·8	8 33	9 0·8	12 8 5·48	1 59 25·37	10 8 40·11
14	Fomalhaut....	35 41	36 13·5	9 36 45·5	37 16·5	37 49	9 36 45·17	1 58 22·94	7 38 22·23
15	Fomalhaut....	.....	31 44	9 32 16	32 47·5	33 19·5	9 32 15·87	1 57 13·15	7 35 2·72
P.M.	2 Ceti	37 53	38 22·5	10 38 51·5	39 19·8	39 49	10 38 51·22	1 57 9·90	8 41 41·32
—	γ Pegasi.....	47 21	47 49·5	10 48 18	48 46	49 14	10 48 17·75	1 57 9·45	8 51 8·3
—	8 Ceti	.....	54 5	10 54 33	55 0·5	55 28·5	10 54 32·87	1 57 9·17	8 57 23·7
—	β „	17 47	18 16·5	11 18 45·5	19 14	19 43·5	11 18 45·33	1 57 7·97	9 21 37·36
—	η „	42 43·5	43 12·5	11 43 40·5	44 8	44 36	11 43 40·17	1 57 6·72	9 46 33·45
—	τ „	18 44	19 13	12 19 42	20 10	20 39	12 19 41·67	1 57 4·92	10 22 36·75
—	ζ „	25 37·5	26 6·5	12 26 34·5	27 2	27 30	12 26 34·17	1 57 4·57	10 29 29·60
16	Sun obscured, weather dark and cloudy. No stars observed during the early part of this evening; heavy rain.								
P.M.	θ Ceti.....	.....	54 09·5	11 54 37	55 4·5	55 32·5	11 54 37	1 55 55·87	9 58 41·13
—	τ „	14 14	14 43·5	12 15 12·2	15 40·5	16 9	12 15 11·9	1 55 54·84	10 19 17·06
—	ζ „	.....	.....	12 22 4·5	22 32	23 0·2	12 22 4·5	1 55 54·49	10 26 10·01
17	⊙'s 1st Limb	6 18·5	6 48	2 7 17·2	7 46	.....	2 8 25·64	1 55 13·74	0 13 11·9
	⊙'s 2d Limb	8 35	9 5·5	2 9 34·5	.....	10 32·5			
P.M.	Fomalhaut....	22 11·7	22 44	9 23 16	23 47·5	24 19·5	9 23 15·78	1 54 52·48	7 28 23·3
—	2 Ceti	.....	.....	.....	.....	30 50	10 29 52·41	1 54 49·15	8 35 3·26
—	☽'s 1st Limb.	.....	.....	11 — —	14 5·5	.....	.....	.....	.....
20	Fomalhaut....	.....	.....	.....	10 17·5	.....	9 9 46·15	1 51 21·73	7 18 24·42
21	⊙'s 1st Limb.	4 58	.....	.....	.....	.....	2 7 6·35	1 50 31·87	0 16 34·48
P.M.	Fomalhaut....	59 32	.....	2 5 57·32	.....	6 19.2	9 5 15·71	1 50 11·35	7 15 4·36
—	β Ceti	50 47	51 16·8	10 51 45·5	52 14·5	52 43·5	10 51 45·47	1 50 6·17	9 1 39·3
—	η „	15 44·5	16 13	11 16 41	17 8·5	17 36·5	11 16 40·75	1 50 4·97	9 26 35·78
—	τ „	51 43·5	52 14	11 52 42·5	53 10·5	53 39	11 52 42	1 50 3·7	10 2 38·83
—	ζ „	58 37	59 6·5	11 59 35	0 2	0 30·2	11 59 34·28	1 50 2·82	10 9 31·46
—	ε Eridani	.....	.....	1 41 8	41 35·5	42 3	1 41 7·82	1 49 57·89	11 51 9·93
—	γ „	5 17	5 45·5	2 6 14	6 42	7 10	2 6 13·75	1 49 56·63	0 16 17·12
22	⊙'s 1st Limb	.....	5 9	2 5 38·5	6 7	6 37	2 6 47·08	1 49 21·38	0 17 25·7
	⊙'s 2d Limb	6 57·5	7 26	2 7 56	8 25	.....			

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1828.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chronom.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
Nov. 23 P.M.	⊙'s 1st Limb	4 21·5	4 51	2 5 20·5	5 49·5	6 19	2 6 29·84	1 48 11·11	0 18 18·73
	⊙'s 2d Limb	6 41	7 10	.....	8 8·5	8 38			
	Instrument well adjusted before the observation commenced, but after transit of the Sun the meridian wire was 4 div. of the mic. screw to the eastward of the mark.								
—	β Ceti	41 47·5	42 17	10 42 46	43 14·5	43 44	10 42 45·83	1 47 46	8 54 59·83
—	η „	6 44·5	7 13	11 7 41	8 8·5	8 37	11 7 40·83	1 47 44·75	9 19 56·08
—	θ „	22 11	22 40	11 23 7·5	23 35	24 3	11 23 7·33	1 47 44	9 35 23·33
—	τ „	42 44·5	43 14	11 43 42·5	44 11	44 39·5	11 43 42·33	1 47 42·98	9 55 59·35
—	ζ „	49 38·5	50 7	11 50 35·5	51 3	51 31	11 50 35·08	1 47 42·65	10 2 52·43
—	δ „	37 12·5	37 41	12 38 8·5	38 35·5	39 3	12 38 8·17	1 47 40·29	10 50 27·88
—	γ „	40 55·5	41 23·8	12 41 51·5	42 18	42 46	12 41 51·05	1 47 40·10	10 54 10·95
—	12 Eridani....	11 3·5	11 36	1 12 7·5	12 39	13 10	1 12 7·25	1 47 38·63	11 24 28·62
—	16 „	.....	.....	1 19 12	19 41·5	20 11·5	1 19 12·18	1 47 38·28	11 31 33·9
—	ε „	31 11·5	31 40	1 32 8	32 35·5	33 3·5	1 32 7·75	1 47 37·63	11 44 30·12
—	δ „	.....	41 49	1 42 17	42 44	43 12·5	1 42 16·75	1 47 37 12	11 54 39·63
—	γ „	56 16·5	56 45·5	1 57 14	57 42	58 10	1 57 13·67	1 47 36·37	0 9 37·30
24	⊙'s 1st Limb	4 5·5	4 35·5	2 5 4	5 33·5	6 3	2 6 13·81	1 47 0·87	0 19 12·94
	⊙'s 2d Limb	6 24·5	6 54·2	2 7 23·5	7 52·5	8 22			
25	Neither Sun nor Stars were observed, the sky being densely clouded; a gale of wind from N.W. with a great deal of fog and small drizzling rain.								
26	⊙'s 1st Limb	3 34	4 4	2 4 34	5 2·8	5 32·50	2 5 43·15	1 44 40	0 21 3·15
	⊙'s 2d Limb	5 53·5	6 23·5	2 6 53	7 21·8	7 51·7			
P.M.	Fomalhaut....	.....	.....	.....	.....	8 43 51·2	8 42 47·71	1 44 20·68	6 58 27·03
—	η Ceti	53 14·5	53 42·2	10 54 11	54 38·5	55 6·8	10 54 10·67	1 44 14·25	9 9 56·42
—	θ „	8 41·5	9 11	11 9 38	10 5·5	10 33	11 9 37·83	1 44 13·48	9 25 24·35
—	τ „	29 15	29 44·5	11 30 13	30 41·5	31 10	11 30 12·83	1 44 12·45	9 46 0·38
—	ζ „	36 8·5	36 37·5	11 37 5·5	37 33	38 1	11 37 5·17	1 44 12·10	9 52 53·07
—	δ „	.....	.....	12 24 39	25 6	25 33	12 24 38·74	1 44 9·78	10 40 28·96
—	γ „	.....	.....	12 28 21·5	28 49	.....	12 28 21·69	1 44 9·59	10 44 12·10
—	η Eridani	41 0·5	41 29	12 41 56·5	42 24·5	42 52	12 41 56·50	1 44 8·91	10 57 47·59

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APPENDIX. TABLE II.—Staten Island.

—	α Ceti	46 16·5	.....	12 47 12	47 39·5	48 7	12 47 18·87	1 44 8·65	11 3 10·22
—	12 Eridani	57 34	58 6·5	12 58 37·5	59 9	59 41	12 58 37·58	1 44 8·08	11 14 29·50
—	16 "	.....	.....	1 5 43	6 11·5	6 42	1 5 42·68	1 44 7·73	11 21 34·95
—	ε "	17 42	18 10·5	1 18 38	19 5·5	19 33·5	1 18 37·92	1 44 7·08	11 34 30·84
—	δ "	.....	.....	.....	29 14·5	29 42·5	1 28 46·93	1 44 6·67	11 44 40·26
—	γ "	42 47	43 16	1 43 44	44 12	44 40	1 43 43·83	1 44 5·92	11 59 37·91
		Commencement of Experiments with Iron and Copper Pendulums.							
December 1	δ Ceti	1 15·5	1 43·5	12 2 11	2 38	3 5·8	12 2 10·80	3 21 22·62	3 23 33·42
P.M.	γ "	4 58·5	5 26	12 5 53·5	6 21	6 48·5	12 5 53·50	3 21 23·05	3 27 16·55
—	η Eridani	18 32	19 1	12 19 29	19 56	20 24	12 19 28·50	3 21 24·63	3 40 53·13
—	α Ceti	23 48·5	24 16·5	12 24 44·5	25 11·5	25 38·8	12 24 44·05	3 21 25·22	3 46 9·27
—	12 Eridani	35 6	35 38·2	12 36 9·5	36 41	37 12·5	12 36 9·45	3 21 26·57	3 57 36·02
—	16 "	.....	42 45	12 43 14·5	43 44	44 13·8	12 43 14·5	3 21 27·46	4 4 41·96
—	ε "	55 14	55 42·5	12 56 10·2	56 37·5	57 5·5	12 56 9·98	3 21 28·98	4 17 38·96
—	δ "	5 23	5 51	1 6 19·5	6 47	7 15	1 6 19·17	3 21 30·18	4 27 49·35
—	γ "	20 19	20 48·2	1 21 16	21 44	22 12·5	1 21 15·95	3 21 31·98	4 42 47·93
Noon 3	⊙'s 1st Limb .	2 10·2	2 40·7	2 3 10·5	3 40	4 9·5	2 4 20·48	3 25 53·70	5 30 14·18
P.M.	β Ceti	56 51·5	57 21	9 57 50	58 18·5	58 47·7	9 57 49·78	3 26 49·78	1 24 39·56
—	η "	.....	.....	10 22 44·5	23 12·5	23 40·8	10 22 44·81	3 26 52·72	1 49 37·53
—	θ "	37 14·5	37 43·5	10 38 11	38 38·5	39 6·5	10 38 10·83	3 26 54·54	2 5 5·37
—	τ "	.....	58 18	10 58 46·5	59 15	59 43·5	10 58 46·5	3 26 56·95	2 25 43·45
—	ζ "	4 42	5 10·5	11 5 39	.....	. ....	11 5 38·73	3 26 57·76	2 32 36·49
—	12 Eridani	26 7·5	26 39·5	12 27 11	27 42	28 14	12 27 10·83	3 27 7·46	3 54 18·29
—	16 "	33 16	33 46	12 34 16	34 45·5	35 15	12 34 15 75	3 27 8·29	4 1 24·04
—	ε "	46 15	46 44	12 47 11·5	47 39	48 6·5	12 47 11·25	3 27 9·82	4 14 21·07
—	δ "	56 24	56 52·5	12 57 21	57 48	58 16	12 57 20·42	3 27 11·04	4 24 31·46
—	γ "	11 20	11 49·5	1 12 18	12 45·5	13 14	1 12 17·5	3 27 12·82	4 39 30·32
4	⊙'s 2d Limb ..	.....	4 53	2 5 22·5	5 52	6 21·5	2 4 12·2	3 28 44·67	5 32 56·87
	No Stars visible	this evening,	there being	a strong gale	from the southward, with a great deal of sleet and hail.				
5	⊙'s 1st Limb	1 52·5	2 23	2 2 53	3 22	3 52	2 4 3·07	3 31 36·13	5 35 39·2
	⊙'s 2d Limb	4 13·5	4 44	2 5 13·8	5 43·2	6 13			
	No Stars observed	this evening,	the sky	being densely	overcast.				

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1828.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
December 6	⊙'s 1st Limb	.....	.....	.....	.....	.....	2 3 55·67	3 34 26·97	5 38 22·64
	⊙'s 2d Limb	.....	.....	.....	5 35·5	6 5·5			
	No observations this evening for the rate of the Clock; the sky overcast.								
7	⊙'s 1st Limb	1 37·2	2 8	2 2 37·5	3 7	3 36·5	2 3 47·92	3 37 17·64	5 41 5·56
	⊙'s 2d Limb	3 58·5	4 29	2 4 58·8	5 28·2	5 58			
	No Stars observed this evening; the sky being densely overcast, and heavy rain occasionally.								
8	The Sun obscured, and with the exception of once or twice in the early part of the morning, his disk was not seen throughout the day; rain occasionally, and thick fog continuing without intermission, and in the space of 16 hours water fell 0·54 inches at intervals. No Stars were visible this evening.								
9	⊙'s 1st Limb .	.....	1 54·5	.....	.....	.....	2 3 35	3 43 0·03	5 46 35·03
P.M.	β Ceti	.....	.....	.....	.....	31 51	9 30 52·83	3 43 52·77	1 14 45·6
—	τ „	30 51·5	31 21	10 31 50	32 18	32 47	10 31 49·58	3 44 0·04	2 15 49·62
—	ζ „	.....	.....	10 38 42	39 9·5	39 38	10 38 42·04	3 44 0·87	2 22 42·91
—	δ „	.....	.....	.....	26 42·5	27 10	11 26 15·36	3 44 6·39	3 10 21·75
—	γ „	29 2·5	29 30·8	11 29 58·2	.....	.....	11 29 58·23	3 44 6·84	3 14 5·07
—	η Eridani	11 42·37	.....	.....	.....	44 29	11 43 33·53	3 44 8·45	3 27 41·98
—	α Ceti	.....	.....	.....	.....	49 43·8	11 48 49	3 44 9·06	3 32 58·06
—	12 Eridani	.....	59 43	12 0 14·5	0 45·5	.....	12 0 14·37	3 44 10·4	3 44 24·77
—	16 „	6 19·8	6 49·5	12 7 19·5	7 48·5	8 18·5	12 7 19·22	3 44 11·23	3 51 30·45
—	ε „	.....	19 47	.....	.....	.....	12 20 14·91	3 44 12·79	4 4 27·7
—	δ „	29 27	29 56	12 30 24	30 51·5	31 20	12 30 23·75	3 44 13·99	4 14 37·74
—	γ „	44 23·5	44 52·5	12 45 21	45 49	46 17	12 45 20·67	3 44 15·83	4 29 36·5
	The Clock was wound up after these Transits. And the Iron Pendulum Experiments commence here.								
10	⊙'s 1st Limb	1 18	1 48	2 2 18·2	2 47·5	3 17·5	2 3 28·67	3 45 50·42	5 49 19·09
	⊙'s 2d Limb	3 39·5	4 9·5	2 4 39·8	5 9	5 39			
	No Stars observed this evening, there being thick fog with heavy rain occasionally.								
11	⊙'s 1st Limb	1 12	1 42	2 2 12	2 41·5	3 11·5	2 3 22·79	3 48 40·43	5 52 3·22
	⊙'s 2d Limb	3 33·5	4 4	2 4 34	5 3·5	5 33·5			
—	α Ceti	.....	.....	.....	40 17·5	40 45	11 39 50·27	3 49 48·03	3 29 38·3
12	Sun obscured; strong gale from the southward, with heavy rain.								

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—	η Eridani	.....	29 38	11 30 6	30 33·5	31 1·5	11 30 5·87	3 52 37·53	3 22 43·4
—	α Ceti	34 25	34 54	11 35 21·5	35 48·5	36 16	11 35 21·08	3 52 38·15	3 27 59·23
—	12 Eridani	45 43	46 15	11 46 47	47 18	47 49·8	11 46 46·63	3 52 39·5	3 39 26·13
—	16 „	52 52	53 22	11 53 52	54 21	54 51	11 53 51·67	3 52 40·34	3 46 32·01
—	ε „	5 51	6 19·5	12 6 47·5	7 15	7 43	12 6 47·25	3 52 41·88	3 59 29·13
—	δ „	15 59·5	16 28·5	12 16 56·5	17 24	17 52	12 16 56·17	3 52 43·08	4 9 39·25
—	γ „	30 56	31 25	12 31 53·5	32 21·5	32 50	12 31 53·25	3 52 44·85	4 24 38·1
13	⊙'s 1st Limb	1 2	1 32	2 2 2·5	2 32	3 2	2 3 13·06	3 54 21·14	5 57 34·2
	⊙'s 2d Limb	3 24	3 54·7	2 4 24	4 53·5	5 23·5			
—	Fomalhaut....	.....	.....	.....	.....	27 30	7 26 26·55	3 54 56·36	11 21 22·91
—	☽'s 1st Limb .	4 58·5	5 27·5	8 5 56	6 23·8	6 52	8 5 55·38	3 55 4·04	0 0 59·42
—	τ Ceti.....	.....	.....	10 13 52·5	14 21	14 50	10 13 52·84	3 55 18·12	2 9 10·96
—	ζ „	.....	20 17	10 20 45·5	21 13	21 41	10 20 45·25	3 55 19·92	2 16 5·17
—	δ „	.....	7 51	11 8 18·5	8 46	9 13	11 8 18·5	3 55 25·53	3 3 44·03
—	γ „	11 5·5	11 33·5	11 12 1	12 28	12 56·5	11 12 0·92	3 55 25·97	3 7 26·89
—	η Eridani	24 40·5	25 0·9	11 25 36·7	26 4·5	26 32·5	11 25 36·65	3 55 27·57	3 21 4·22
—	α Ceti	29 56·5	30 24·5	11 30 52	31 19	31 47	11 30 51·83	3 55 28·18	3 26 20·01
—	12 Eridani....	.....	.....	11 42 17·5	42 48·5	43 20·5	11 42 17 43	3 55 29·54	3 37 46·97
—	16 „	48 22·5	48 52·5	11 49 22·5	49 51·5	50 21·5	11 49 22·17	3 55 30·38	3 44 52·55
—	ε „	1 21·5	1 50	12 2 18	2 45·5	3 13·5	12 2 17·75	3 55 31·92	3 57 49·67
—	δ „	11 30·5	11 59	12 12 27	12 54·5	13 22·5	12 12 26·75	3 55 33·13	4 7 59·88
—	γ „	26 26·5	26 55·5	12 27 24	27 52	28 20·2	12 27 23·7	3 55 34·92	4 22 58·62
14	⊙'s 1st Limb	.....	1 28	.....	2 17·5	2 58	2 3 8·23	3 57 11·52	6 0 19·75
	⊙'s 2d Limb	3 18·5	3 49	2 4 19	4 49	5 19			
P.M.	☽'s 1st Limb .	.....	.....	8 — —	56 17	56 45·5			
—	η Eridani	20 10·5	20 39	.....	21 34·5	22 2·5	11 21 6·63	3 58 17·39	3 19 24·02
—	α Ceti	25 26·5	25 55	11 26 23	26 49·5	27 17	11 26 22·33	3 58 18·01	3 24 40·34
—	12 Eridani....	36 44	37 16·5	11 37 48	38 19·5	38 51	11 37 47·83	3 58 19·37	3 36 7·20
—	16 „	43 53	44 23	11 44 53	45 22	45 51·5	11 44 52·58	3 58 20·21	3 43 12·79
—	ε „	56 52·5	57 20·5	11 57 48·5	58 16	58 44	11 57 48·33	3 58 21·73	3 56 10·06
—	δ „	7 1	7 29·5	12 7 58	8 25·5	8 53	12 7 57·5	3 58 22·95	4 6 20·45
—	γ „	21 57·2	22 26·5	12 22 54·5	23 22·5	23 50·5	12 22 54·28	3 58 24·71	4 21 18·99

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1828.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
Dec. 15	⊙'s 1st Limb	0 52·5	1 23	2 1 53	2 22·5	2 52·5	2 3 3·67	4 0 2·18	6 3 5·85
	⊙'s 2d Limb	3 14	3 45	2 4 15	4 44·5	5 14			
P.M.	τ Ceti	.....	.....	10 4 54	5 22·2	5 50·8	10 4 53·84	4 0 59·28	2 5 53·12
—	η Eridani	.....	.....	.....	.....	17 33·5	11 16 38·03	4 1 7·77	3 17 45·8
—	α Ceti	.....	.....	11 21 53	22 20	22 48	11 21 53·01	4 1 8·37	3 23 1·38
—	12 Eridani	32 14·5	32 46·5	11 33 18·5	33 49·5	34 21	11 33 18·08	4 1 9·71	3 34 27·79
—	16 „	.....	.....	11 40 23·5	40 53	41 22·5	11 40 23·55	4 1 10·55	3 41 34·1
—	ε „	52 22	52 51	.....	.....	.....	11 53 18·67	4 1 12·06	3 54 30·73
—	δ „	2 31·5	3 0	12 3 28	3 55·5	4 23·5	12 3 27·75	4 1 13·25	4 4 41
—	γ „	17 27·5	17 56·5	12 18 25	18 52·5	19 21·5	12 18 24·67	4 1 15·08	4 19 39·75

South Shetland.

Times by Chron. 799.

1829.				Computed Time.					
January 16	⊙'s 1st Limb / 2d Limb placed in the visible from	obscured throughout; meridian, and the following Transits taken on the the foggy state of the weather in the evening of the		4 10 22·42	10 53	11 23	By this observation the Instrument was evening of the 17th, there being neither Sun nor Stars 16th and forenoon of the 17th.		
17	Fomalhaut	.....	58 51·2	6 59 23·8	59 55	0 27·8	6 59 23·45	3 36 56·8	3 22 26·65
				Times by Chron. 620.					
—	α Columbæ ...	.....	18 50	.....	19 55·5	.....	11 19 22·75	1 12 21·9	10 7 0·85
—	α Orionis	30 53·4	31 22	11 31 50	32 17	32 45	11 31 49·57	1 12 20·93	10 19 28·64
—	Sirius	.....	22 52·5	12 23 21	23 49	24 18	12 23 20·87	1 12 16·92	11 11 3·95
18	⊙'s 1st Limb	43 7·5	43 37·5	1 44 7	44 36	45 5·5	1 45 16·16	1 11 14·25	0 33 58·91
	⊙'s 2d Limb	45 26	45 56·2	1 46 26	46 55	47 24·2			
	Sky densely clouded, sleet, rain, and thick foggy weather, with strong winds from northward up to the 23rd.								
23	⊙'s 1st Limb	.....	42 14	.....	43 11	43 40·2	1 43 50·92	1 1 50·72	0 41 57·16
	⊙'s 2d Limb	44 1	44 31	1 45 0	45 29	.....			
26	⊙'s 1st Limb	40 43·5	41 13·5	1 41 42·2	42 11	42 40	1 42 50·68	0 56 12·32	0 46 35·29
	⊙'s 2d Limb	43 1	43 30·8	0 43 59·5	44 28	44 57			
28	Rigel	.....	2 26·2	10 2 54·5	3 21·5	3 49·4	10 2 54·17	0 51 47·63	9 11 6·54

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—	α Columbæ ...	28 49·4	29 23	10 29 56	30 29	31 2·2	10 29 55·93	0 51 45·54	9 38 10·39
29	⊙'s 2nd Limb.	.....	.....	1 — —	.....	43 49·2	1 41 40·05	0 50 34·03	0 51 6·02
February 1	⊙'s 1st Limb	38 22	38 51·5	1 39 20·5	39 48·7	40 17·7	1 40 28·24	0 44 55·18	0 55 33·06
	⊙'s 2d Limb	40 38·2	41 7·8	1 41 36·5	42 5	42 34			
P.M.	Aldebaran	.....	.....	9 4 51	5 19·5	5 48	9 4 51·14	0 44 20·32	8 20 30·82
—	Rigel	43 59	44 27	9 44 55	45 22·5	45 50·5	9 44 54·83	0 44 17·18	9 0 37·65
—	α Columbæ ...	10 49·5	11 23·5	10 11 57	12 29·5	13 2·5	10 11 56·5	0 44 15·08	9 27 41·42
—	α Orionis	23 28	23 56	10 24 24	24 51	25 19	10 24 23·67	0 44 14·11	9 40 9·56
—	Sirius	.....	15 25·5	11 15 55	16 23	16 52	11 15 54·62	0 44 10·03	10 31 44.59
—	Procyon	7 34·5	.....	12 8 30	8 57·5	9 25	12 8 29·87	0 44 5·83	11 24 24·04
—	α Hydræ	.....	.....	.....	57 27	57 55	1 56 59·71	0 43 57·28	1 13 2·43
2	⊙'s 1st Limb	37 55·7	38 25	1 38 54	39 22	39 51	1 40 1·46	0 43 1·70	0 56 59·76
	⊙'s 2d Limb	40 11·8	40 41	1 41 9·5	41 37·5	42 6·5			
	No Stars visible, dense overcast weather.								
3	⊙'s 2d Limb .	.....	40 14	1 — —	41 9	.....	1 39 33·75	0 41 8·19	0 58 25·56
	Strong gale from North and N.E. with the most violent squalls I ever experienced; sky overcast with scud and dust.								
4 Noon	⊙'s 1st Limb	36 59·5	37 28·5	1 37 57	38 25	38 54	1 39 4·54	0 39 12·84	0 59 51·7
	⊙'s 2d Limb	39 14·5	39 44	1 40 12·5	40 40·5	41 9·5			
P.M.	Rigel	30 27·5	30 56	9 31 24	31 51	32 19	9 31 23·58	0 38 35·31	8 52 48·27
—	α Columbæ ...	57 18·5	57 52·5	9 58 25·5	58 58·5	59 31·5	9 58 25·33	0 38 33·13	9 19 52·2
—	α Orionis	9 56·5	10 24·5	10 10 53	11 20	11 48	10 10 52·5	0 38 32·13	9 32 20·37
—	Sirius	1 26	1 55·5	11 2 23·5	2 52·5	3 21	11 2 23·67	0 38 28·04	10 23 55·63
—	Procyon	54 3·5	54 31·5	11 54 59	55 26·5	55 54·5	11 54 59	0 38 23·83	11 16 35·17
—	α Hydræ	.....	43 1	1 43 28·5	43 56	44 24	1 43 28·5	0 38 15·18	1 5 13·32
5	⊙'s 1st Limb	36 29	36 58	1 37 26·5	37 55	38 23·5	1 38 34·06	0 37 17·88	1 1 16·18
	⊙'s 2d Limb	38 44	39 13	1 39 42	40 10·2	40 39			
—	Rigel	.....	.....	9 26 54	27 20·5	27 48·5	9 26 53·44	0 36 40·77	8 50 12·67
—	α Columbæ ...	52 47·8	53 21·5	9 53 55	54 27·5	55 1	9 53 54·63	0 36 38·62	9 17 16·01
—	α Orionis	5 26	5 54·5	10 6 22	6 49·5	7 17	10 6 21·83	0 36 37·63	9 29 44·2
—	Sirius	56 56	57 25	10 57 53·5	58 21·7	58 50·5	10 57 53·37	0 36 33·53	10 21 19·84
—	Procyon	.....	.....	11 50 29	.....	.....	11 50 29	0 36 29·36	11 13 59·64
—	α Hydræ	38 2	38 29·8	1 38 58	39 25·5	39 53	1 38 57·72	0 36 20·75	1 2 36·97

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1829.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
February 7	⊙'s 1st Limb	35 28	35 57·5	1 36 25·5	36 54	37 22·5	1 37 32·89	0 33 29·35	1 4 3·54
P.M.	⊙'s 2d Limb	37 43	38 12	1 38 40·5	39 8·5	39 37·2			
	Rigel	16 56·5	17 25	9 17 53	18 20	18 48	9 17 52·58	0 32 53·04	8 44 59·54
—	α Columbæ ...	43 47	44 21	9 44 54·5	45 26·8	46 0·5	9 44 54·05	0 32 50·88	9 12 3·17
—	α Orionis	56 26	56 54·5	9 57 22	57 49·5	58 17	9 57 21·83	0 32 49·93	9 24 31·90
—	Sirius	47 55	48 24·5	10 48 53	49 21	49 49·8	10 48 52·72	0 32 45·87	10 16 6·85
—	Procyon	40 32	41 0·5	11 41 28	41 55·5	42 23	11 41 27·83	0 32 41·76	11 8 46·07
—	α Hydræ	.....	29 29·5	1 29 57·5	30 25	30 52·5	1 29 57·37	0 32 33·19	0 57 24·18
	Here ends the Experiments with the Brass Pendulums.								
8	⊙'s 1st Limb	34 56	35 26	1 — —	.....	.....	1 37 0·95		
	⊙'s 2d Limb	37 11	37 39·5	1 38 8	38 36·5	29 4·7			
	Commencement of Experiments with convertible Pendulums.								
9	⊙'s 1st Limb	34 24·5	34 53	1 35 21·8	35 49·2	36 18·5	1 36 28·58	2 24 14·65	11 12 13·93
	⊙'s 2d Limb	36 38·2	37 7·5	1 37 36	38 4	38 32·5			
	No Stars visible; sky densely overcast.								
10	⊙'s 1st Limb .	.....	34 21·2	1 34 49·5	34 49·56	1 7·05	1 35 56·61	2 21 0·89	11 14 55·72
	Light air and calm weather; sky densely overcast, neither Sun nor Stars visible in this interval.						any part of the heavens at any time during		
12	⊙'s 1st Limb	.....	33 12·5	1 — —	.....	.....	1 34 47	2 14 32·44	11 20 14·56
	⊙'s 2d Limb	.....	.....	1 — —	36 21·5	.....			
13	⊙'s 1st Limb	.....	32 38	1 33 6·5	33 34·5	34 2·5	1 34 12·84	2 11 18·03	11 22 54·81
	⊙'s 2d Limb	34 22·5	34 51·5	1 35 19·8	35 47·5	36 16			
P.M.	Rigel	49 58·5	50 27	8 50 54·8	51 22	51 50	8 50 54·52	2 10 19·25	6 40 35·27
—	α Columbæ ...	16 49	17 23	9 17 56	18 29	19 2	9 17 55·83	2 10 15·60	7 7 40·23
—	α Orionis	.....	.....	.....	.....	31 19	9 30 23·84	2 10 13·93	7 20 9·91
17	⊙'s 1st Limb	29 41·7	30 10·2	1 30 38·5	31 6·2	31 34·2	1 31 44·36	1 58 19·14	11 33 25·22
	⊙'s 2d Limb	31 54	32 23	1 32 50·5	33 18·5	33 46·5			
21	⊙'s 2d Limb..	.....	.....	.....	.....	31 6	1 29 4·30	1 45 17·29	11 43 47·01
23	⊙'s 1st Limb	25 38	26 6·5	1 26 35	27 3	.....	1 27 39·88	1 38 46·5	11 48 53·38
	⊙'s 2d Limb	56·55	.....	1 28 45	.....	.....			

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25	⊙'s 1st Limb	24 11·5	24 40	1 25 7·5	25 35	26 2·8	1 26 12·77	1 32 14·81	11 53 57·96
	⊙'s 2d Limb	26 22	26 50·8	1 27 18·5	27 45·5	28 13·7			
28	⊙'s 1st Limb	21 58	22 26	1 22 54	23 21	23 49	1 23 59	.....	.....
	⊙'s 2d Limb	24 08·5	24 37	1 25 4·5	25 32	25 59·5			

Cape Horn.

April 15	⊙'s 1st Limb	.....	11 23·2	1 11 51	12 18	12 46 5	1 12 55·53	1 14 37·98	11 58 17·55
	⊙'s 2d Limb	.....	13 32	0 1 4·7	14 28	14 56			
	No Stars visible; strong gale from westward, with sleet, hail, and rain.								
	After the following Transit Instrument was moved of the Sun, a little.			the Clock was	stopped to	re-adjust Pendulum of Experiment, and			the Transit
16	⊙'s 1st Limb	10 5·5	10 34	1 11 2	11 29	11 57	1 12 6·32	1 13 18·56	11 58 47·76
	⊙'s 2d Limb	12 15	.....	13 11·5	13 38·5	14 7			
—	α Hydræ	51 2	51 30	8 51 58	52 25	.....	8 51 57·75	1 23 29·51	7 28 28·24
—	ψ Argus	.....	.....	8 56 45·5	7 20·5	.....	8 56 45·38	1 23 29·25	7 33 16·13
			Pendulum	Experiments	commenced	P.M. 19th.			
19	⊙'s 1st Limb	7 37	8 6	1 8 34·5	9 2	9 30	1 9 39·23	1 19 54·23	11 49 45
	⊙'s 2d Limb	9 48	10 17	1 10 44·8	11 12·2	11 40			
P.M.	Sirius	56 22	56 51	5 57 20	57 48	58 16·2	5 57 19·71	1 19 38·48	4 37 41·23
—	γ^2 Argus	22 23	23 4	7 23 44	24 23·5	25 4	7 23 44·08	1 19 33·53	6 4 10·55
—	α Hydræ	37 29	37 57·5	8 — —	38 52·5	.....	8 38 25·17	1 19 29·44	7 18 55·73
—	Regulus	.....	.....	.....	18 49·5	19 17·5	9 18 21·57	1 19 27·29	7 58 54·28
—	μ Hydræ	35 56·5	36 24·5	9 36 53	37 21	37 49·5	9 36 53·16	1 19 26·27	8 17 26·89
—	ν Hyd. & Crat.	59 13·2	59 42·5	10 0 11	0 39	1 7	10 0 10·61	1 19 25·07	8 40 45·54
—	α „	.....	.....	.....	10 53	11 21·5	10 10 24·4	1 19 24·42	8 50 59·98
—	β „	21 11·5	21 41·5	10 22 11	22 39	23 9·5	10 22 10·79	1 19 23·77	9 2 47·02
—	δ „	28 44·5	29 13·5	10 29 41·5	30 9·5	30 37·5	10 29 41·57	1 19 23·36	9 10 18·21
—	τ Leonis	37 4·5	37 32·5	10 38 0·5	38 27·5	38 54·5	10 38 0·09	1 19 22 89	9 18 37·2
—	β Virginis	59 39·5	0 7·5	11 0 35	1 2	1 29·5	11 0 34·96	1 19 21·66	9 41 13·3
—	δ Centauri	.....	17 36	11 18 19	19 1	19 43·5	11 18 18·86	1 19 20·7	9 58 58·16

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Appendix. Table II.—Cape Horn.

1829.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
April 19	η Virginis	28 56·5	29 24·5	11 29 52	30 19	30 46·5	11 29 51·95	1 19 20·28	10 10 31·67
P.M.	Spica Virginis .	33 45·5	34 14·5	12 34·42	35 9	35 37·5	12 34 41·96	1 19 16·53	11 15 25·43
—	„	45 15	45 43·5	1 46 11·5	46 39	47 7·5	1 46 11·33	1 19 12·54	0 26 58·79
—	☽'s 2d Limb ..	55 37·8	56 6·5	1 56 36	57 4	57 33	1 56 35·55	1 19 11·97	0 37 23·58
—	„	.....	59 12·5	1 59 40·5	0 8·5	0 37	1 59 40·5	1 19 11·8	0 40 28·7
—	„	2 23·5	2 52	2 3 20	3 47·5	4 15·5	2 3 19·75	1 19 11·6	0 44 8·15
20	Sky densely overcast, with heavy rain occasionally, neither Sun nor Stars visible.								
21	⊙'s 1st Limb	6 2·5	6 31	1 6 59·5	7 27	7 55	1 8 4·17	1 17 15·17	11 50 49
	⊙'s 2d Limb	8 12·4	8 41·2	1 9 9·5	9 37·4	10 5·6			
—	Canopus	29 23·5	30 10	5 30 55	31 39·5	32 24·8	5 30 54·98	1 17 0·56	4 13 54·42
—	Sirius	47 21	47 50·5	5 48 19	48 47·5	49 15·5	5 48 18·97	1 16 59·74	4 31 19·23
—	Procyon	39 57	40 25·5	6 40 53	41 20·2	41 47·6	6 40 52·92	1 16 56·78	5 23 56·14
—	γ^2 Argus	13 22	14 3·5	7 14 43·5	15 23	16 3	7 14 43·38	1 16 54·37	5 57 49·01
—	α Hydræ	.....	.....	.....	.....	30 19	8 29 24·68	1 16 50·76	7 12 33·92
—	42 Hydræ	26 54	27 23	9 27 51·5	28 20	28 48·5	9 27 51·66	1 16 47·61	8 11 4·05
—	ν Hyd. & Crat.	.....	50 42	9 51 10·5	51 38·5	52 7	9 51 10·43	1 16 46·22	8 34 24·21
—	α „	0 25·5	0 55	10 1 24	1 52·2	2 21	10 1 23·49	1 16 45·66	8 44 37·83
—	β „	12 10·5	12 41	10 13 10·5	13 39	14 9·5	10 13 10·38	1 16 45·02	8 56 25·36
—	δ „	.....	.....	10 20 41	21 9	21 37	10 20 40·93	1 16 44·6	9 3 56·33
—	τ Leonis	28 4	28 32	10 29 0	29 27	29 54·5	10 28 59·76	1 16 44·14	9 12 15·62
—	δ Centauri	7 52·5	8 35·5	11 9 18·7	10 1	10 42·5	11 9 18·44	1 16 41·89	9 52 36·55
—	γ Corvi	.....	16 15·5	11 16 44·5	17 12·8	17 41·5	11 16 44·41	1 16 41·54	10 0 2·87
—	δ Virginis	55 39	56 7	11 56 34·5	57 1·5	57 29	11 56 34·46	1 16 39·36	10 39 55·1
—	Spica Virginis .	24 45·5	25 13·5	12 25 41·5	26 9	26 37	12 25 41·56	1 16 37·77	11 9 3·79
22	γ^2 Argus	.....	.....	7 10 14·5	10 54·5	11 34	7 10 14·48	1 15 35·94	5 54 38·54
—	42 Hydræ	22 25	22 54	9 23 22·5	23 50·2	24 19	9 23 22·40	1 15 28·66	8 7 53·74
—	ν Hyd. & Crat.	45 43	46 12	9 46 40·5	47·8	47·37	9 46 40·37	1 15 27·4	8 31 12·97
—	α „	55 56	56 25	9 56 54	57 22·2	57 51	9 56 53·91	1 15 26·84	8 41 27·07
—	β „	7 41	8 11	10 8 40·5	9 9·5	9 39·5	10 8 40·58	1 15 26·14	8 53 14·44
—	δ „	15 14	15 43·5	10 16 11·5	16 39	17 7·5	10 16 11·36	1 15 25·92	9 0 45·54

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—	τ Leonis	23 34·5	24 2	10 24 30	24 57	25 24·5	10 24 29·66	1 15 25·27	9 9 4·39
—	β Virginis	46 9·5	46 37	10 47 5	47 31·2	47 59·5	10 47 4·69	1 15 24·1	9 31 40·59
—	δ Centauri	.....	4 6·8	11 4 48·8	5 30·5	6 13	11 4 48·76	1 15 23·06	9 49 25·7
—	γ Corvi	11 17	11 46	11 12 15	12 42·5	13 11·5	11 12 14·67	1 15 22·65	9 56 52·02
—	η Virginis	15 26	15 54	11 16 21·5	16 48·5	17 16	11 16 21·45	1 15 22·43	10 0 59·02
—	δ „	51 9	51 37·5	11 52 5	52 31·5	52 59·5	11 52 4·76	1 15 20·5	10 36 44·26
—	Spica Virginis .	20 16	20 44·5	12 21 12	21 39·5	22 7·5	12 21 12·16	1 15 18·94	11 5 53·22
23	⊙'s 2d Limb..	.....	7 10	1 7 37·5	.....	8 34	1 6 32·62	1 14 36·83	11 51 55·79
—	Regulus	59 24·5	.....	9 0 21·5	.....	1 17·5	9 0 21·47	1 14 10·7	7 46 10·77
—	42 Hydræ	17 55·5	18 24·5	9 18 53·2	.....	.....	9 18 53·19	1 14 9·68	8 4 43·51
—	η Virginis.....	10 56	.....	11 — —	.....	12 46·5	11 11 51·69	1 14 3·5	9 57 48·19
—	δ „	.....	47 7·5	11 47 35·5	.....	48 29·5	11 47 35·07	1 14 1·53	10 33 33·54
24	☽'s 2d Limb..	20 27·6	20 58	5 21 28	21 57	22 27	5 21 27·6	1 13 42·43	.....
A.M.	α Sagittarii....	43 6	43 37	5 44 8	44 38·2	45 9	5 44 7·7	1 13 41·08	.....
—	ο „	.....	.....	5 53 52·5	54 21·5	54 51·5	.....	.....	.....
Noon	⊙'s 1st Limb	3 44·5	4 13·2	1 4 41·5	5 9·5	5 37·2	1 5 46·49	1 13 17·08	11 52 29·41
	⊙'s 2d Limb	5 55	6 24	1 6 52	7 19·5	7 48			
P.M.	Canopus	.....	.....	.....	.....	18 55·5	5 17 25·43	1 13 3·14	4 4 22·29
—	α Hydræ	14 58·5	15 27	8 15 54·5	16 21·7	16 49·5	8 15 54·5	1 12 53·33	7 3 1·17
25	Regulus.....	50 24·5	50 53	8 51 21	.....	52 17	8 51 21·2	1 11 31·71	7 39 49·49
—	α Hyd. & Crat.	42 26	42 55·5	9 43 24·5	.....	.....	9 43 24·35	1 11 28·87	8 31 55·48
—	δ „	1 44	.....	10 — —	3 9	.....	10 2 41·17	1 11 27·81	8 51 13·36
—	τ Leonis.....	.....	.....	10 — —	11 27	11 55	10 11 0·02	1 11 27·35	8 59 32·67
—	β Virginis	32 39·5	33 7	10 33 34·5	34 1·5	34 29	10 33 34·56	1 11 26·11	9 22 8·45
—	δ Centauri	.....	50 36·5	10 — —	.....	52 43	10 51 18·68	1 11 25·13	9 39 53·55
—	γ Corvi	57 47	.....	10 — —	.....	.....	10 58 44·99	1 11 24·72	9 47 20·27
	Wound the Clock up before the A.M. coincidences of the 26th, and was doubtful whether the going spring was quite equal to its task.								
26	⊙'s 1st Limb	.....	2 43·2	1 — —	.....	.....	1 4 17	1 10 39·52	11 53 37·48
	⊙'s 2d Limb	4 25	4 54·5	1 — —	5 51	6 19			
—	No Stars visible this evening, there being heavy rain and high westerly winds.								

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1829.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chronom.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
April 27	β Hyd. & Crat.	45 11	45 41	9 — —	46 39·5	.....	9 46 10·61	1 8 51·25	8 37 19·36
P.M.	β Virginis	23 39	24 6·8	10 24 34·5	.....	.....	10 24 34·48	1 8 49·19	9 15 45·29
—	δ Centauri	.....	41 36·5	10 42 18·5	43 0·5	43 43·5	10 42 18·73	1 8 48·23	9 33 30·5
—	γ Corvi	48 46·5	49 15·5	10 49 44·5	50 12·5	50 41	10 49 44·27	1 8 47·83	9 40 56·44
—	η Virginis.....	52 56	53 23·7	10 53 51·5	.....	.....	10 53 51·42	1 8 47·6	9 45 3·82
—	δ „	.....	.....	11 — —	30 2	30 29	11 29 34·49	1 8 45·64	10 20 48·85
—	ε „	.....	35 45·5	11 36 13·5	36 41	37 9	11 36 13·51	1 8 45·27	10 27 28·24
—	Spica	57 45·5	58 14	11 58 41·5	59 9	59 37	11 58 41·66	1 8 44·05	10 49 57·61
28	α Hydræ	56 58	57 27	7 — —	.....	.....	7 57 54·42	1 7 37·49	6 50 16·93
—	ε Virginis.....	.....	.....	11 — —	.....	32 39	11 31 43·12	1 7 25·69	10 24 17·43
	Constant and heavy rain during this interval; wind fresh from Westward and						W.S.W.		
May 1	⊙'s 2d Limb..	.....	.....	1 1 47·8	2 15·5	2 44	1 0 41·67	1 4 1·85	11 56 39·82
P.M.	β Virginis	.....	.....	10 — —	7 2	.....	10 6 34·88	1 3 31·72	9 3 3·16
—	γ Corvi	30 46·2	31 15·5	10 31 44·2	.....	.....	10 31 44·19	1 3 30·34	9 28 13·85
—	η Virginis.....	.....	.....	10 35 51	36 18	.....	10 35 50·95	1 3 30·11	9 32 20·84
	Sun obscured, weather thick with snow, and wind very strong from W.S.W.; no Stars visible this evening, and the weather has been such as not to admit of Sun or Star being seen before the evening of the 3rd.								
3	α Hyd. & Crat.	6 25·5	6 54·5	9 7 23	.....	.....	9 7 23·35	1 0 55·39	8 6 27·96
—	β „	18 10	18 40	9 19 9·5	19 39	20 8·5	9 19 9·68	1 0 54·74	8 18 14·94
—	δ „	25 43·5	26 12	9 — —	.....	.....	9 26 40·35	1 0 54·33	8 25 46·02
—	ι Leonis	29 55	30 23·5	9 30 51	31 19	31 47	9 30 51·36	1 0 54·1	8 29 57·26
—	β Virginis	56 38	.....	9 — —	.....	58 28	9 57 33·44	1 0 52·63	8 56 40·81
—	γ Corvi	.....	22 15·5	10 22 43	.....	.....	10 22 43·58	1 0 51·26	9 21 52·32
—	η Virginis	25 55	26 23	10 — —	.....	27 45	10 26 50·46	1 0 51·04	9 25 59·42
—	ε „	.....	8 44·5	11 9 12·5	.....	.....	11 9 12·4	1 0 48·74	10 8 23·66
	Sun obscured by clouds; wind fresh from Westward.								
4	α Hydræ	.....	30 25	7 30 53	31 20	31 48	7 30 52·79	0 59 40·32	6 31 12·47
—	μ „	28 23	28 52·5	8 — —	29 48·5	30 17·5	8 29 20·7	0 59 37·06	7 29 43·64
—	ν Hyd. & Crat.	51 41	52 10	8 52 38·5	53 6·5	53 35	8 52 38·47	0 59 36·79	7 53 1·68
—	α „	1 54	2 23·5	9 2 52·5	3 20·5	.....	9 2 52·29	0 59 35·24	8 3 17·05

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—	β Virginis	.....	52 35·5	9 53 3	.....	.....	9 53 3	0 59 32·37	8 53 30·63
—	γ Corvi	17 15	17 44·2	10 18 13	18 41	19 9·5	10 18 12·81	0 59 30·68	9 18 42·13
	Constant rain,	without the	least clearing	g away of the	sky since the	4th, so that	no Stars could	be observed.	
14	Antares	43 18·5	43 50	1 44 20·5	44 50·5	45 21	1 44 20·38	0 47 27	0 56 53·38

Cape of Good Hope.

August 7	α Herculis	.....	10 25	8 10 53·5	11 21·4	11 49·9	8 10 53·39	1 1 40·92	7 9 12·47
P.M.	α Lyræ.....	33 47	34 23	9 34 58·5	35 33	36 8·5	9 34 58·33	1 1 44·94	8 33 13·39
—	β „	46 27·5	47 0·5	9 47 33·5	48 6	48 38·5	9 47 33·51	1 1 45 59	8 45 47·92
—	γ „	.....	55 46	9 56 18·5	56 50·7	57 23	9 56 18·42	1 1 46·05	8 54 32·37
—	ζ Aquilæ	0 21	0 49·5	10 1 18	1 45·4	2 14	10 1 17·65	1 1 46·31	8 59 31·34
—	δ „	.....	.....	.....	21 1·5	.....	10 20 34·37	1 1 47·24	9 18 47·13
—	γ „	40 50	41 19	10 41 47·5	42 15	42 42·5	10 41 47·06	1 1 48·27	9 39 58·79
—	α „	.....	45 37·5	10 46 5	46 32·2	47 0	10 46 4·7	1 1 48·49	9 44 16·21
—	β „	49 37	50 5	10 50 32·5	51 0	51 27·5	10 50 32·63	1 1 48·76	9·48 43·87
—	α^2 Capricorni ..	11 11·5	11 40	11 12 8	12 36	13 4·2	11 12 7·95	1 1 50·03	10 10 17·92
—	γ Cygni	.....	19 4	11 19 40	20 15	20 51	11 19 39·84	1 1 50·22	10 17 49·62
—	α „	37 49·5	38 29·5	11 39 7·6	39 46	40 24·5	11 39 7·45	1 1 51·13	10 37 16·32
8	⊙'s 1st Limb	11 27	11 56	12 12 24	12 52·5	13 21			
	⊙'s 2d Limb	13 38	14 6·4	0 14 35·5	15 3·4	15 32·5	12 13 29·65	1 2 27·68	11 11 1·97
—	☽'s 1st Limb..	32 48·2	33 17·8	6 33 46·5	34 15·2	34 44·4	6 33 46·43	1 2 45·7	5 31 0·73
—	Antares	18 17·5	18 48·5	7 19 19·5	19 49·5	20 20	7 19 19·08	1 2 47·98	6 16 31·1
—	α Herculis	6 9·5	6 38·5	8 7 7	7 35	8 3	8 7 6·67	1 2 50·35	7 4 16·32
—	α Ophiuchi....	26 15·5	26 44·5	8 27 12·5	27 40·5	28 8·5	8 27 12·7	1 2 51·32	7 24 21·38
—	β „ ...	34 17	34 45	8 35 13	35 40	36 8	8 35 12·86	1 2 51·6	7 32 21·26
—	γ „ ...	38 34·5	39 2·5	8 — —	39 57·5	40 24·5	8 39 30·07	1 2 51·83	7 36 38·24
—	α Lyræ.....	30 0·5	30 36·5	9 31 11·5	31 46·5	32 22	9 31 11·71	1 2 54·32	8 28 17·39
—	β „	42 41	.....	9 — —	.....	44 52	9 43 47·03	1 2 54·93	8 40 52·1
—	γ „	51 26·5	.....	9 — —	53 4·5	53 36·5	9 52 32·12	1 2 55·35	8 49 36·77
—	ζ Aquilæ	56 33·5	57 3·5	9 57 31·5	57 59·5	58 27·5	9 57 31·17	1 2 56·59	8 54 34·58
—	γ „	.....	37 32	10 38 0	38 27·5	38 55·5	10 37 59·95	1 2 57·57	9 35 2·38

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Appendix. Table II.—*Cape of Good Hope.*

1829.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
August 8	α Aquilæ	41 22	41 50	10 42 18	42 45·5	43 13	10 42 17·7	1 2 57·72	9 39 19·98
P.M.	β „	45 49·5	46 18	10 46 45·5	47 13	47 40·5	10 46 45·3	1 2 57·96	9 43 47·34
—	α^2 Capricorni ..	7 24	7 53	11 8 21·5	8 49·5	9 17·5	11 8 21·17	1 2 58·5	10 5 22·67
—	γ Cygni	14 40·5	15 17	11 15 53	16 28	17 4	11 15 52·5	1 2 59·41	10 12 53·09
—	α „	34 2·5	34 42	11 35 20·5	35 59	36 37·5	11 35 20·33	1 3 0·34	10 32 19·99
9	⊙'s 1st Limb	11 29	11 58	0 12 26·5	12 55	13 23·5	12 13 31·81	1 3 36·54	11 9 55·27
	⊙'s 2d Limb	13 40·2	14 8·5	0 14 37·5	15 5·5	15 34			
—	Antares	14 30·5	15 1·5	7 15 32·4	16 2·5	16 33·5	7 15 32·13	1 3 56·65	6 11 35·48
—	θ Ophiuchi ...	16 59·5	17 28·8	7 17 57·5	18 25·5	18 54·5	7 17 57·06	1 3 56·78	6 14 0·28
—	☽'s 1st Limb..	23 21	23 51	7 24 20·2	24 49·5	25 18·5	7 24 20·07	1 3 57·08	6 20 22·99
—	η Ophiuchi ...	.....	56 36·5	7 57 5	57 33	58 2	7 57 5·03	1 3 58·67	6 53 6·36
—	α Herculis	2 22·5	2 51	8 3 19·5	3 47	4 15·5	8 3 19·17	1 3 58·96	6 59 20·21
—	α Ophiuchi....	22 28·5	22 57	8 23 25	23 53	24 21	8 23 24·19	1 3 59·95	7 19 24·24
—	β „	30 30	30 58	8 31 25·5	31 53	32 20	8 31 25·3	1 4 0·34	7 27 24·96
—	γ „	34 47	35 15	8 35 42·5	36 9·2	36 37·5	8 35 42·25	1 4 0·55	7 31 41·7
—	α Lyræ.....	26 13·5	26 49	9 27 24	27 59	28 34	9 27 23·9	1 4 3·06	8 23 20·84
—	β „	38 53·5	39 27	9 40 0	40 32·5	41 5	9 39 59·6	1 4 4·11	8 35 55·49
—	γ „	47 39·5	48 12·5	9 48 45	49 17	49 49·2	9 48 44·65	1 4 4·54	8 44 40·11
—	ζ Aquilæ	52 47·5	53 16·2	9 53 44·5	54 12	54 40·5	9 53 44·2	1 4 4·78	8 49 39·42
—	δ „	12 6	12 33·8	10 13 1·4	13 28	13 56	10 13 1·04	1 4 5·69	9 8 55·35
—	γ „	.....	33 45·5	10 34 13·5	34 41	35 8·5	10 34 13·33	1 4 6·23	9 30 7·1
—	α „	37 34·5	38 3	10 38 31	38 58·5	39 26	10 38 30·6	1 4 6·44	9 34 24·16
—	β „	42 3·2	42 31·5	10 42 59	43 26	43 54	10 42 58·42	1 4 6·66	9 38 51·76
—	α^2 Capricorni ..	3 37·5	4 6·5	11 4 34·5	5 2·5	5 30·5	11 4 34·33	1 4 7·66	10 0 26·67
—	γ Cygni	10 53·7	11 29·5	11 12 6	12 41	13 17	11 12 5·44	1 4 8·08	10 7 57·36
—	α „	30 15	30 54·2	11 31 33·2	32 11	32 49·5	11 31 32·68	1 4 9·03	10 27 23·65
10	Sun obscured, wind fresh from N. W. with dark cloudy weather, and rain occasionally.								
—	Antares	10 43	11 14·5	7 11 45	12 15	12 45·5	7 11 44·67	1 5 5·1	6 6 39·57
—	η Ophiuchi....	52 19·5	52 49·2	7 53 17·5	53 45	.....	7 53 17·29	1 5 7·25	6 48 10·04
—	☽'s 1st Limb..	16 49·5	17 19·7	8 17 49·2	18 18·5	18 48	8 17 48·95	1 5 8·48	7 12 40·47

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—	D Ophiuchi ...	24 29	25 19·5	8 25 49	26 18	26 47·7	8 25 48·64	1 5 8·86	7 20 39·78
—	γ „ ...	31 0	31 29	8 31 55·5	32 22·5	32 50·5	8 31 55·5	1 5 9·15	7 26 46·35
—	μ′ Sagittarii ...	55 5·5	.....	8 56 5·5	56 34·5	57 3·5	8 56 5·22	1 5 10·45	7 50 54·77
—	α Lyræ.....	22 26·5	23 2	9 23 37·5	24 12	24 47	9 23 37·08	1 5 11·74	8 18 25·34
—	β „	35 6	35 40	9 36 12·8	36 45	37 18·5	9 36 12·46	1 5 12·33	8 31 0·13
—	γ „	43 52·5	44 25·5	9 44 58	45 30	46 2	9 44 57·6	1 5 12·83	8 39 44·77
—	ζ Aquilæ	49 0	49 29	9 — —	50 25	50 53·5	9 49 57·15	1 5 13	8 44 44·15
—	α „	33 47·5	34 16	10 34 43·5	35 11	35 38·5	10 34 43·3	1 5 15·16	9 29 28·14
—	α^2 Capricorni..	59 50·5	0 19	11 0 47	1 15	1 43	11 0 46·92	1 5 16·51	9 55 30·41
—	γ Cygni.....	7 7	7 43	11 8 18·5	8 53·7	9 29·5	11 8 18·34	1 5 16·87	10 3 1·47
—	α „	26 27·7	27 7	11 27 46	28 24·2	29 3	11 27 45·65	1 5 17·8	10 22 27·85
11	⊙'s 1st Limb	11 28	11 57·2	12 12 26	12 54	13 22	12 13 30·84	1 5 54·6	11 7 36·24
	⊙'s 2d Limb	13·39·2	14 8	12 14 36	15 4·5	15 33·2			
—	Antares.....	.....	7 27·5	7 — —	8 28·5	8 58·5	7 7 58·49	1 6 14·39	6 1 44·1
—	α Herculis....	.....	.....	7 — —	.....	56 42	7 55 44·63	1 6 16·66	6 49 27·97
—	α Ophiuchi ...	.....	.....	8 15 51·5	16 19	16 48	8 15 51·55	1 6 17·69	7 9 33·86
—	β „ ...	22 56	23 24·5	8 23 52	24 19	24 46·5	8 23 51·6	1 6 18·03	7 17 33·57
—	γ „ ...	27 13	27 41	8 28 8·5	28 35·8	29 3·2	8 28 8·3	1 6 18·48	7 21 49·82
—	μ′ Sagittarii ...	51 19	51 48·5	8 52 18·2	52 47	53 16·7	8 52 17·85	1 6 19·43	7 45 58·42
—	(92) Sagittarii.	9 9·5	9 39·5	9 10 8·2	10 37	.....	9 10 8·31	1 6 20·29	8 3 48·02
—	☽'s 1st Limb..	12 55	13 25·5	9 13 54·5	14 24	14 53·4	9 13 54·48	1 6 20·47	8 7 34·01
—	α Lyræ	18 40	19 16	9 19 50·5	20 25·5	21 0·5	9 19 50·5	1 6 20·75	8 13 29·75
—	r Sagittarii ...	27 12·5	27 42	9 28 12	28 40·7	29 10	9 28 11·44	1 6 21·15	8 21 50·29
—	β Lyræ	31 19·5	31 53	9 32 26	32 58	33 31·2	9 32 25·45	1 6 21·44	8 26 4·01
—	γ „	40 5·5	40 39	9 41 11·5	41 43·5	.....	9 41 11·47	1 6 21·86	8 34 49·61
—	ζ Aquilæ	45 13·5	45 42·5	9 46 11	46 38·5	47 7	9 46 10·58	1 6 22·1	8 39 48·48
—	π Sagittarii ...	.....	.....	9 48 12·5	48 42	49 11·8	9 48 12·5	1 6 22·2	8 41 50·3
12	⊙'s 1st Limb	11 25	11 57·5	12 12 26	12 54·2	.....	12 13 31·66	1 7 3·75	11 6 27·91
	⊙'s 2d Limb	.....	.....	12 — —	15 5	.....			
	Dark cloudy weather, with rain.								
13	⊙'s 1st Limb	11 27·2	11 56·2	12 12 24·5	12 52·6	13 21·1	12 13 29·59	1 8 12·55	11 5 17·04
	⊙'s 2d Limb	13 38	14 6·8	12 14 35	15 3	15 31.2			

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1829.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
August 13	Antares	59 22	.....	7 0 24	0 54	1 24·5	7 0 23·83	1 8 32·05	5 51 51·78
P.M.	α Herculis	47 14	47 43	7 48 12	48 39·5	49 6·5	7 48 11·2	1 8 33·36	6 39 37·84
—	α Ophiuchi ...	.....	.....	8 8 17·5	8 45·5	9 13	8 8 17·39	1 8 35·38	6 59 42·01
—	β „ ...	15 22	15 50	8 16 18	16 44·5	17 12·5	8 16 17·4	1 8 35·81	7 7 41·59
—	γ „ ...	19 39·5	20 7·5	8 20 34·5	21 2	21 29·5	8 20 34·74	1 8 35·97	7 11 58·77
—	α Lyræ	11 5·5	11 41·5	9 12 16·5	12 51	13 26·5	9 12 16·2	1 8 38·49	8 3 37·71
—	β „	23 46	24 19	9 24 52	25 24·2	25 57	9 24 51·52	1 8 38·93	8 16 12·59
—	γ „	32 32	33 5	9 33 37	34 9·5	34 42	9 33 37·1	1 8 39·11	8 24 57·99
—	ζ Aquilæ	37 39	38 7·5	9 38 36	39 4	39 32	9 38 35·75	1 8 39·75	8 29 56
—	δ „	56 57	57 25	9 57 52·5	58 19·5	58 47	9 57 52·2	1 8 40·68	8 49 11·52
—	γ „	18 8·5	18 36·5	10 19 5	19 32·5	20 0	10 19 4·5	1 8 41·74	9 10 22·76
—	α „	22 27	22 55	10 23 22·5	23 49·5	24 17·5	10 23 22·3	1 8 41·96	9 14 40·34
—	β „	26 54·5	27 22·5	10 27 50·5	28 17·5	28 45	10 27 50	1 8 42·17	9 19 7·83
—	α^2 Capricorni ..	48 28·8	48 57·5	10 49 26	49 53·5	50 21·8	10 49 25·52	1 8 43·12	9 40 42·4
—	γ Cygni	55 44·5	56 21·5	10 56 57	57 32·8	58 8·5	10 56 56·86	1 8 43·59	9 48 13·27
—	☽'s 1st Limb..	9 27	9 56·8	11 10 26	10 54·2	11 23·5	11 10 25·58	1 8 44·41	10 1 41·17
—	α Cygni	15 6·5	15 46	11 16 25	17 3·5	17 42	11 16 24·67	1 8 44·59	10 7 40·08
—	ε Aquarii	.....	18 44·5	11 19 12·2	19 40	20 7·8	11 19 12·33	1 8 44·75	10 10 27·58
—	ν „	40 4	40 33	11 — —	.....	.....	11 41 0·95	1 8 45·81	10 32 15·14
			Commencement of Experiments with Pendulum No. 10.						
27	⊙'s 2d Limb ..	.....	.....	12 13 38	14 5·5	14 33	12 12 33·22	1 24 40·9	10 47 52·32
P.M.	γ Lyræ	39 46	40 19·5	8 40 52	41 24	41 56·5	8 40 51·6	1 25 5·77	7 15 45·83
—	ζ Aquilæ	44 54	45 23	8 45 51·2	46 19	46 47·5	8 45 50·98	1 25 6·01	7 20 44·97
—	δ „	4 12·5	4 40	9 5 8	5 34·5	6 2·5	9 5 7·5	1 25 6·93	7 40 0·57
—	α „	29 41·5	30 10	9 30 37·5	31 5	31 33	9 30 37·4	1 25 8·15	8 5 29·25
—	β „	34 09·5	34 38	9 35 5·5	35 32·5	36 0·5	9 35 5·2	1 25 8·27	8 9 56·93
—	α^2 Capricorni ..	55 44	56 13	9 56 41	57 9	57 37	9 56 40·83	1 25 9·96	8 31 30·87
—	α Cygni	22 21·5	23 1·5	10 23 40	24 18·5	24 57	10 23 39·75	1 25 10·8	8 58 28·95
28	⊙'s 1st Limb	.....	.....	12 — —	11 49	12 17	12 12 25·42	1 25 50·84	10 46 34·58
	⊙'s 2d Limb	12 33·5	13 2	12 13 30	13 57·5	14 25·5			

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APPENDIX. TABLE II.—Cape of Good Hope.

—	α Lyræ.....	14 33	15 9	8 15 43·5	16 18·5	16 54	8 15 43·2	1 26 13·98	6 49 29·22
—	β „	27 13·8	27 46·5	8 28 19·2	28 51·5	29 24·5	8 28 19·1	1 26 14·08	7 2 5·02
—	γ „	35 59	36 32·2	8 37 5	37 37	38 9·7	8 37 4·58	1 26 15·01	7 10 49·57
—	ζ Aquilæ	41 7·5	41 36	8 42 4	42 32·5	43 0·5	8 42 4·08	1 26 15·24	7 15 48·84
—	δ „	0 25	0 53·5	9 1 21	1 47·7	2 15·5	9 1 20·54	1 26 16·29	7 35 4·25
—	γ „	21 36	22 4·5	9 22 32·5	23 0	23 28	9 22 32·2	1 26 17·11	7 56 15·09
—	α „	25 54·5	26 22·5	9 26 50·4	27 18	27 45·5	9 26 50·18	1 26 17·22	8 0 32·96
—	β „	30 22·5	30 50·5	9 31 18·2	31 45·5	32 13	9 31 17·94	1 26 17·66	8 5 0·28
—	α^3 Capricorni ..	51 57·2	52 26	9 52 54·5	53 22	53 50·5	9 52 54·12	1 26 18·72	8 26 35·42
—	γ Cygni	59 13·5	59 49·5	10 0 25·5	1 0·5	1 36	10 0 25	1 26 19·06	8 34 5·94
—	α „	18 35	19 14·5	10 19 52·5	20 30·5	21 9·5	10 19 52·42	1 26 20·03	8 53 32·39
29	⊙'s {1st Limb	10 16·2	10 44·7	12 11 12·8	11 40	12 8	12 12 16·62	1 26 59·5	10 45 17·12
	{2d Limb	12 25	12 53	12 13 21	13 48·5	14 16·5			
September 1	α Lyræ	59 25·5	0 1·5	8 0 36·5	1 11	1 46	8 0 36·1	1 30 53·21	6 29 42·89
P.M.	β „	12 5·5	12 39	8 13 11·5	13 44	14 16·5	8 13 11·3	1 30 53·84	6 42 17·46
—	γ „	20 51	21 23·5	8 21 57	22 29	23 2	8 21 56·5	1 30 54·29	6 51 2·21
—	ζ Aquilæ	25 59·5	26 28	8 26 56·5	27 24·5	27 53	8 26 56·33	1 30 54·59	6 56 1·74
—	δ „	45 18	45 45·5	8 46 13·5	46 40·5	47 8	8 46 13·1	1 30 55·5	7 15 17·6
2	⊙'s {1st Limb	9 39·5	10 8	12 10·36	11 3·5	11 31	12 11 39·68	1 31 41	10 39 58·68
	{2d Limb	11 48	12 16	12 12·44	13 11·5	13 39			
—	α Lyræ	55 48·5	56 14	7 56 49·4	57 23	57 59·2	7 56 50·82	1 32 3·87	6 24 46·95
—	β „	8 18·5	8 52	8 9 24·5	9 57	10 30	8 9 24·4	1 32 4·34	6 37 20·06
—	γ „	17 4·5	17 38	8 18 10·5	18 42·5	19 14·8	8 18 10·06	1 32 4·78	6 46 5·28
—	ζ Aquilæ.....	.....	22 41·5	8 23 9·5	23 37·5	24 6	8 23 9·5	1 32 5·03	6 51 4·47
—	ε „	41 31	41 59	8 42 26·5	42 53·5	43 21	8 42 26·2	1 32 5·98	7 10 20·22
—	γ „	2 42	3 10·5	9 3 38	4 6	4 33·5	9 3 38	1 32 7·04	7 31 30·96
—	α „	7 0	7 28·5	9 7 56	8 23·5	8 51·5	9 7 55·9	1 32 7·26	7 35 48·64
—	β „	11 28	11 56	9 12 24	12 51	13 18·8	9 12 23·56	1 32 7·47	7 40 16·09
—	α^3 Capricorni ..	33 2·5	33 31	9 33 59·5	34 27	34 55·5	9 33 59·17	1 32 8·54	8 1 50·63
—	γ Cygni	40 18·5	40 54·5	9 41 30·5	42 6	42 41·5	9 41 30·2	1 32 8·92	8 9 21·28
—	α „	59 40	0 20	10 0 58·5	1 36·5	2 15·5	10 0 58·17	1 32 9·89	8 28 48·28
4	Aldebaran	45 29·5	45 58·5	5 46 27	46 55·5	47 24·2	5 46 26·94	1 33 43·22	4 12 43·72

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1829.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
September 4	Rigel	25·36	26 4	6 26 32	26 59·5	27 27·5	6 26 31·8	1 33 45·2	4 52 46·6
A.M.	γ Orionis	35 13·5	35 41·5	6 36 9·5	36 36·5	37 4	6 36 9	1 33 45·67	5 2 23·33
—	δ „	42 31	42 59	6 43 26·5	43 53·5	44 21	6 43 26·2	1 33 46·13	5 9 40·07
—	ε „	46 46	47 14	6 47 41·5	48 9	48 36·5	6 47 41·4	1 33 47·34	5 13 54·06
—	ζ „	51 21	51 49	6 52 16·5	52 43·5	53 11	6 52 16·2	1 33 47·46	5 18 28·74
—	⊙'s 1st Limb	9 20·5	9 48·5	12 10 16·5	10 43·5	11 11·5	12 11 20·07	1 34 1·96	10 37 18·11
	⊙'s 2d Limb	11 28·5	11 56·5	12 12 24	12 51·4	13 19·5			
P.M.	ζ Aquilæ	14 39·5	15 8·5	8 15 36·5	16 4	16 32·5	8 15 36·25	1 34 25·39	6 41 10·86
		Commencement		of Experiments	with Convertible Pendulums.				
October 26	Sirius	40 36	41 6	4 41 33·5	42 1·5	42 30·5	4 41 33·5	4 55 5·38	11 46 28·12
A.M.	Castor	.....	26 58·5	5 27 31	28 3	28 35·5	5 27 30·94	4 55 3·38	0 32 27·56
—	Procyon	33 13·5	33 41·5	5 34 9·5	34 36·5	35 4	5 34 9	4 55 3·1	0 35 5·9
—	Pollux	37 35·5	38 7·5	5 38 39	39 9·8	39 41	5 38 38·56	4 55 2·9	0 43 35·66
—	α Hydræ	.....	22 13·5	7 22 41·5	23 9	23 37	7 22 41·54	4 54 58·37	2 27 43·17
—	⊙'s 1st Limb	2 53·5	3 22	0 3 50·5	4 18	4 46·5	0 4 56·08	4 54 45·96	7 10 10·12
	⊙'s 2d Limb	5 5·2	5 34	0 6 2·2	6 30	6 58·4			
P.M.	β Aquarii	.....	23 43	7 24 10·5	24 37·5	25 6	7 24 10·59	4 54 26·51	2 29 44·08
—	α „	.....	58 4·5	7 58 32	58 59	59 27	7 58 32·73	4 54 25·14	3 4 7·59
—	α Pegasi	.....	.....	.....	58 6	58 34·5	8 57 38·18	4 54 22·52	4 3 15·66
—	α Andromedæ .	59 45	0 17	10 0 48	1 18	1 50	10 0 47·67	4 54 19·75	5 6 27·92
—	γ Pegasi	4 42·5	5 11	10 5 39	6 7·2	6 36	10 5 39·12	4 54 19·54	5 11 19·58
27	Sirius	36 49	37 18	4 37 46·5	38 14·5	38 43·5	4 37 46·33	4 54 2·25	11 43 44·08
A.M.	Castor	22 38	23 11·2	5 23 44·2	24 16	24 48·5	5 23 43·68	4 54 0·25	0 29 43·43
—	Procyon	29 26·5	29 55	5 30 22·5	30 50	31 17·5	5 30 22·3	4 53 59·93	0 36 22·37
—	Pollux	33 48·5	34 20·5	5 34 52	35 23	35 54·2	5 34 51·65	4 53 59·73	0 40 51·92
—	α Hydræ	17 58·5	18 27	7 18 55	19 22	19 50	7 18 54·5	4 53 55·19	2 24 59·31
—	⊙'s 1st Limb	2 56·5	3 26·5	0 3 52·5	4 21·5	4 49·5	0 4 59·17	4 53 42·52	7 11 16·65
	⊙'s 2d Limb	5 8·5	5 37	0 6 5·5	6 33	7 1·5			
P.M.	α Aquilæ	.....	.....	5 40 31·5	40 59	41 26·5	5 40 31·37	4 53 27·63	0 47 3·74
—	β Aquarii	19 27·5	19 55·5	7 20 23	20 50·5	21 18	7 20 22·9	4 53 23·29	2 26 59·61

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Appendix. Table II.—Cape of Good Hope.

—	α "	.....	.....	7 54 45	55 12	55 40	7 54 45·1	4 53 21·17	3 1 23·93		
—	α Pegasi	52 54·2	53 23	8 53 51	54 19	54 47·5	8 53 50·94	4 53 19·21	4 0 31·73		
—	α Andromedæ .	56 57	56 30	9 57 1	57 32	58 3·5	9 57 0·7	4 53 16·45	5 3 44·25		
—	γ Pegasi	.....	.....	10 1 52·2	2 20·5	2 48·7	10 1 52·34	4 53 16·24	5 8 36·1		
28	Sirius	33 1	33 30·5	4 33 59	34 27·5	34 56·5	4 33 59·92	4 52 58·84	11 41 0·08		
A.M.	Castor	18 51	19 24	5 19 57	20 29	21 1·5	5 19 56·58	4 52 56·78	0 26 59·8		
—	Procyon	25 39	26 7·4	5 26 34·5	27 2	27 30	5 26 34·57	4 52 56·49	0 33 38·08		
—	Pollux	30 1·5	30 33·5	5 31 4·5	31 35·5	32 6·5	5 31 4·33	4 52 56·3	0 38 8·03		
—	α Hydræ	.....	14 39·5	7 15 7	15 34·5	16 2	7 15 7·04	4 52 51·72	2 22 15·32		
—	⊙'s {1st Limb	.....	3 29	0 3 57·5	4 25	4 53·5 }		4 52 38·89	7 12 24·63		
	{2d Limb	5 12·5	5 41·5	0 6 10	6 37·5	7 6 }	0 5 3·52				
P.M.	α Aquilæ	35 48	36 16·5	5 36 44·5	37 11·5	37 39·5	5 36 44·09	4 52 24·06	0 44 20·02		
—	β Aquarii	15 40	16 8	7 16 36	17 3·5	17 31	7 16 35·75	4 52 19·7	2 24 16·05		
—	α "	50 2	50 30	7 50 57·5	51 24·5	51 52	7 50 57·25	4 52 18·16	2 58 39·09		
—	α Pegasi	49 6·5	49 35	8 50 3·5	50 31·2	50 59·6	8 50 3·16	4 52 15·57	3 57 47·59		
—	α Andromedæ .	52 10·5	52 42·5	9 53 13	53 43·7	54 15	9 53 12·95	4 52 12·81	5 1 0·14		
—	γ Pegasi	57 7·5	57 36	9 58 4·5	58 32·5	59 0·5	9 58 4·25	4 52 12·61	5 5 51·64		
29	Sirius	29 14·2	29 43	4 30 11·5	30 40	31 8·5	4 30 11·45	4 51 55·23	11 38 16·22		
A.M.	Castor	15 3·5	15 36·5	5 16 9·5	16 41	17 14	5 16 9	4 51 53·25	0 24 15·75		
—	Procyon	21 51·5	22 20	5 22 47·5	23 15	23 42·5	5 22 47·3	4 51 52·94	0 30 54·36		
—	Pollux	26 13·8	26 46	5 27 17·5	27 48	28 19	5 27 16·86	4 51 52·77	0 35 24·09		
—	α Hydræ	.....	10 52	7 11 19·5	11 47	12 15	7 11 19·64	4 51 48·19	2 19 31·45		
Noon	⊙'s {1st Limb	3 4·8	3 33·5	0 4 1·5	4 29·5	4 58 }		4 51 35·12	7 13 32·5		
	{2d Limb	5 17·2	5 45·5	0 6 14	6 42	7 10 }	0 5 7·62				
	No Stars visible this evening, sky densely overcast, with occasional showers of rain.										
	N.B. Before this at 12 o'clock	morning's observations by it.		the Clock had become deranged by the minute hand fouling the hour hand when							
30	Castor	11 15	11 48	5 12 21	12 53	13 25·5	5 12 20·5	4 51 31·5	0 20 49		
A.M.	Procyon	18 3·5	18 31·5	5 18 59	19 26·5	19 54	5 18 58·9	4 51 31·24	0 27 26·66		
—	Pollux	22 25·5	22 57·5	5 23 29	23 59·6	24 31	5 23 28·52	4 51 31·05	0 31 57·47		
—	α Hydræ	6 35·5	7 4	7 7 31·5	7 59	8 27	7 7 31·4	4 51 26·48	2 16 4·92		

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1829.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
October 30	⊙'s 1st Limb	.....	3 37·5	0 4 6	4 34	5 2	0 5 11·93	4 51 13·36	7 13 58·57
Noon	⊙'s 2d Limb	5 21	5 50	0 6 18	6 46	7 14			
P.M.	α Aquilæ	28 12	28 40·5	5 29 8	29 35·5	30 3·5	5 29 7·9	4 50 59·11	0 38 8·79
—	β Aquarii	8 4	8 32	7 9 0	9 27	9 55	7 8 59·67	4 50 54·8	2 18 4·87
—	α „	42 26·5	42 54·5	7 43 22	43 49	44 17	7 43 21·8	4 50 53·52	2 52 28·28
—	α Pegasi.....	41 31	42 0	8 42 28	42 56·2	43 24·5	8 42 27·94	4 50 50·66	3 51 37·28
—	α Andromedæ .	44 35	.....	9 45 38	46 8·8	.....	9 45 37·99	4 50 47·95	4 54 50·04
—	γ Pegasi	49 32·2	50 1·5	9 — —	50 57·5	51 25·7	9 50 29·55	4 50 47·73	4 59 41·82
31	Sirius.....	21 39	22 7·7	4 22 36·5	23 5	23 33·5	4 22 36·37	4 50 30·51	11 32 5·86
A.M.	Castor	7 27·5	8 1	5 8 33·5	9 5·5	9 38	5 8 33·17	4 50 28·47	0 18 4·7
—	Procyon	.....	.....	5 — —	15 39·5	16 7	5 15 12·09	4 50 28·22	0 24 43·87
—	Pollux	18 38	19 10	5 19 41·5	20 12·5	20 43·5	5 19 41·17	4 50 26·98	0 29 14·19
P.M.	☽'s 1st Limb..	2 37·5	3 8	3 3 37·5	4 6·7	4 36·5	3 3 37·35	4 50 1·2	10 13 36·15
—	α Aquilæ	24 25·4	24 53·4	5 25 21·5	25 49	26 0·17	5 25 21·3	4 49 56·02	0 35 25·28
—	β Aquarii	4 17	4 45	7 5 13	5 40	6 7·5	7 5 12·58	4 49 51·64	2 15 20·94
—	α Andromedæ .	.....	.....	9 — —	42 21	42 52	9 41 50·16	4 49 44·81	4 52 5·35
—	γ Pegasi	45 44·5	46 13·5	9 46 42	47 10	47 38	9 46 41·6	4 49 44·6	4 56 57
				End of Experiments with Iron Pendulum.					
November 2	β Aquarii	56 43	57 11·5	6 57 39	58 6·5	58 34	6 57 38·83	4 47 45·34	2 9 53·49
P.M.	α „	31 5·5	31 33·5	7 32 1	32 28·5	32 56	7 32 0·9	4 47 44·2	2 44 16·7
—	α Andromedæ .	33 13·5	33 45·5	9 34 16·5	34 47·5	35 18·5	9 34 16·3	4 47 38·99	4 46 37·31
—	γ Pegasi	38 11	38 39·5	9 39 8	39 36	40 4·5	9 39 7·83	4 47 38·78	4 51 29·05
—	Occultation of	a small Star	by the ☽'s	dark limb at 9h	57m 46s, by	Chronom.	929, observed	by Mr. Fallows	, who stated
	that it re-ap	peared about	10s afterwa	rds.					
—	Occultation of	another sma	ll Star by the	☽ at 9h 59m	20s; this w	as the time	it disappeared.	but on looking	again at the
	☽, a lumino	us point app	eared near t	he spot of occu	ltation, and	became extin	ct at 10h 0m	30s by 929; this	was observed
	by myself wi	th a 46 inch	Telescope by	Dollond.					
	The Moon's limb	was undula	ting much at	the time: and	the Stars w	hich, before	occultation, w	ere distinctly v	isible, became
	quite dull an	d ill-defined	points of lig	ht, some minut	es before the	observation	was made; whi	ch was ascribed	to the effect of
	wind, which	was then blo	wing strong	from the South.					
3	Castor	56 7	56 40·5	4 57 13·5	57 45	58 17·5	4 57 12·83	4 47 19·63	0 9 53·2

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A.M.	Procyon	2 55·5	3 23·5	5 3 51·5	4 18·5	4 46	5 3 51·08	4 47 19·36	0 16 31·72
—	Pollux	7 17·5	7 49·5	5 8 21	8 51·5	9 23	5 8 20·58	4 47 19·17	0 21 1·41
—	α Hydræ	51 27·5	51 55·8	6 52 23·5	52·51	53 19	6 52 23·38	4 47 14·75	2 5 8·63
P.M.	α Aquilæ	13 4	13 32·5	5 14 0·5	14 27·5	14 55·5	5 14 0·8	4 46 47·29	0 27 12·79
—	☽'s 1st Limb .	41 34·2	42 4	5 42 33·5	43 2	43 31·5	5 42 33·12	4 46 46·06	0 55 47·06
—	β Aquarii	52 56	53 24	6 53 52	54 19·2	54 47	6 53 51·7	4 46 42·97	2 7 8·73
—	α Pegasi.....	26 23	26 52	8 27 20	27 48·5	28 16·5	8 27 20	4 46 38·94	3 40 41·06
—	α Andromedæ .	29 27	29 59	9 30 30·5	31 1	31 32	9 30 29·9	4 46 36·24	4 43 53·66
—	γ Pegasi.....	34 24·5	34 53·5	9 35 22·5	35 50	36 18	9 35 21·83	4 46 35·99	4 48 45·84
4	Castor	52 21	52 54·2	4 53 27	53 59	54 31·5	4 53 26·62	4 46 16·78	0 7 9·84
A.M.	Procyon	59 9	59 37·5	5 0 5	0 32·5	1 0	5 0 4·67	4 46 16·52	0 13 48·15
—	Pollux	3 31	4 2·5	5 4 34	5 5	5 36·5	5 4 33·83	4 46 16·31	0 18 17·52
—	α Hydræ	47 41	48 9·5	6 48 37	49 4	49 32	6 48 36·75	4 46 12·23	2 2 24·52
Noon	☉'s 1st Limb	3 47·2	4 17·5	0 4 46·5	5 14·5	5 43	0 5 52·89	4 45 57·88	7 19 55·01
	☉'s 2d Limb	6 2·5	6 31·5	0 7 0	7 28·5	7 57			
P.M.	α Aquilæ	9 18	9 46	5 10 14	10 41·5	11 9·5	5 10 13·83	4 45 44·46	0 24 29·37
—	☽'s 1st Limb .	35 9·8	35 38·8	6 36 7·5	30 36	37 5	6 36 7·43	4 45 40·7	1 50 26·73
—	β Aquarii	49 9·5	49 37·5	6 50 5·5	50 32·5	51 0·5	6 50 5·17	4 45 40·13	2 4 25·04
—	α „	23 32	23 59·5	7 24 27	24 54	25 22	7 24 26·92	4 45 38·64	2 38 48·28
—	α Pegasi	22 36·5	23 5·5	8 23 33·5	24 1·5	24 30	8 23 33·25	4 45 36·03	3 37 57·22
—	α Andromedæ .	.....	26 12	9 26 43·5	27 14	27 45·5	9 26 43·25	4 45 33·23	4 41 10·02
—	γ Pegasi	30 37·5	31 6·5	9 31 34·5	32 2·5	32 31	9 31 34·42	4 45 33·07	4 46 1·35
5	Castor	48 33·5	49 7	4 49 39·5	50 11·5	50 44	4 49 39·17	4 45 14	0 4 25·17
A.M.	Procyon	55 22	55 50·2	4 56 17·8	56 45·5	57 13	4 56 17·72	4 45 13·68	0 11 4·04
—	Pollux	59 44	0 16	5 0 47	1 18	1 49·5	5 0 46·92	4 45 13·49	0 15 33·43
—	α Hydræ	43 53·5	44 22	6 44 49·5	45 17	45 45	6 44 49·42	4 45 8·89	1 59 40·53
Noon	☉'s 1st Limb	3 59	4 28	0 4 56·7	5 25	5 53·5	0 6 3·57	4 44 54·85	7 21 8·72
	☉'s 2d Limb	6 13	6 42	0 7 11	7 39	8 8			
P.M.	α Aquilæ	5 30·5	5 58·8	5 6 27	6 54·2	7 22	5 6 26·58	4 44 41·65	0 21 44·93
—	α Aquarii	19 45	20 12·8	7 20 4	21 7·5	21 35	7 20 40·05	4 44 35·94	2 36 4·11
—	☽'s 1st Limb .	28 36	29 4·7	7 29 33·5	30 2	30 30·5	7 29 33·37	4 44 35·56	2 44 57·81
—	λ Aquarii	6 18·5	6 47	8 7 14·5	7 42	8 10	8 7 14·42	4 44 33·87	3 22 40·55

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1829.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
November 5	α Pegasi	18 49	19 17·5	8 19 46	20 14·5	20 42·5	8 19 45·92	4 44 33·35	3 35 12·57
P.M.	α Andromedæ .	21 53·5	22 25	9 22 56	23 27	23 58	9 22 55·92	4 44 30·66	4 38 25·26
—	γ Pegasi	26 50	27 19	9 27 47·5	28 15	28 44	9 27 47·17	4 44 30·43	4 43 16·74
	After these Transits, and just before the passage of the morning Stars, the minute hand of the Clock caught the hour hand, and stopped in consequence.								
6	Procyon.....	51 35	52 3·5	4 clouded sky.		53 25·8	4 52 30·94	5 1 47·12	11 50 43·82
A.M.	α Hydræ	40 06·5	40 35	6 41 3	41 30	41 58	6 41 2·58	5 1 42·36	1 30 29·22
—	Regulus.....	20 4	20 33	7 21 1	21 28·5	21 57	7 21 0·75	5 1 40·01	2 19 20·74
Noon	⊙'s 1st Limb	4 9·5	4 39	0 5 7·5	5 35·7	6 4·5	0 6 14·52	5 1 28·18	7 4 46·34
	⊙'s 2d Limb	6 24	6 53·2	0 7 22	7 50·2	8 19			
P.M.	α Aquilæ	1 43·5	2 11·5	5 2 39·5	3 7	3 35	5 2 39·33	5 1 15·16	0 1 24·17
—	☽'s 1st Limb .	22 2·5	22 31·5	8 23 0	23 27·5	23 55·5	8 22 59·83	5 1 6·77	3 21 53·06
—	α Andromedæ .	18 6	18 37·5	9 19 8·5	19 39·5	20 11	9 19 8·5	5 1 4·09	4 18 4·41
—	γ Pegasi	23 3	23 32	9 24 0·5	24 28	24 56·5	9 24 0·08	5 1 3·94	4 22 56·14
7	Castor	41 0	41 33	4 42 5·5	42 37·5	43 10	4 42 5·25	5 0 44·71	11 41 20·54
A.M.	Procyon.....	47 48	48 16·5	4 48 43·5	49 11	49 38·5	4 48 43·5	5 0 44·46	11 47 59·04
—	Pollux	52 10	52 42	4 53 13·5	53 44·5	54 15·5	4 53 13·1	5 0 44·22	11 52 28·88
—	α Hydræ	.....	36 47·5	6 37 15·5	.....	.....	6 37 15·37	5 0 39·72	1 36 35·65
Noon	⊙'s 1st Limb	4 21	4 50·5	0 5 19·5	5 47·5	6 16	0 6 26·35	5 0 25·31	7 6 1·04
	⊙'s 2d Limb	6 35·7	7 5	0 7 34	8 2·5	8 31			
P.M.	α Aquilæ	57 55·7	58 24	4 58 52	59 19·5	59 47	4 58 51·7	5 0 12·45	11 58 39·25
—	α Aquarii.....	12 9·5	12 37·5	7 13 5	13 32	13 59·8	7 13 4·8	5 0 6·67	2 12 58·13
—	α Pegasi	11 14·5	11 43	8 12 12	12 39·5	13 8	8 12 11·5	5 0 4·25	3 12 7·25
—	☽'s 1st Limb .	15 49·5	16 18	9 16 46	17 14·2	17 42·5	9 16 46·03	5 0 1·33	4 16 44·7
—	γ Pegasi	.....	.....	9 20 12·5	.....	.....	9 20 12·5	5 0 1·17	4 20 11·33
8	Castor	37 12·5	37 45·5	4 38 18·4	38 50	39 23	4 38 17·97	4 59 42·24	11 38 35·73
A.M.	Procyon.....	44 0·5	44 28·5	4 44 56·5	45 23·5	45 51·5	4 44 56·17	4 59 41·86	11 45 14·31
—	Pollux	48 23·5	48 55	4 49 26	49 57	50 28	4 49 25·9	4 59 41·72	11 49 44·18
—	α Hydræ	32 32	33 0·5	6 33 28·5	33 55·5	34 23·5	6 33 28·08	4 59 37·11	1 33 50·97
—	Regulus.....	12 29·5	12 58	7 13 26·2	13 54	14 22·5	7 13 26·05	4 59 35·31	2 13 50·74

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Noon	⊙'s 1st Limb	4 33·5	5 2·5	0 5 31·7	5 59·9	6 28·5	0 6 38·79	4 59 22·56	7 7 16·23	
	⊙'s 2d Limb	6 48·5	7 17·7	0 7 46·5	8 15	8 43·5				
P.M.	α Aquilæ	54 8·5	54 36·5	4 55 4·5	55 32	55 59·5	4 55 4·2	4 59 9·9	11 55 54·3	
—	β Aquarii	.....	.....	6 — —	35 23·5	35 51	6 34 56·1	4 59 5·54	1 35 50·56	
—	α „	8 22·5	8 50	7 9 17·5	9 45	10 12·5	7 9 17·5	4 59 4·06	2 10 13·44	
—	α Pegasi	7 27	7 56	8 8 24·5	8 52	9 21	8 8 24·17	4 59 1·49	3 9 22·68	
—	☽'s 1st Limb .	10 22	10 50·5	10 11 18·5	11 46·7	.....	10 11 18·55	4 58 56·11	5 12 22·44	
9	Castor	33 25	33 58	4 34 30	35 2·5	35 35	4 34 30·08	4 58 39·47	11 35 50·61	
A.M.	Procyon	.....	.....	4 41 9	41 36	42 4	4 41 8·92	4 58 39·18	11 42 29·74	
—	Pollux	44 35·5	45 7	4 45 38·2	46 9	46 40·5	4 45 38·04	4 58 38·98	11 46 59·06	
—	α Hydræ	28 44·5	29 13	6 29 40·5	30 8	30 36	6 29 40·42	4 58 34·4	1 31 6·02	
P.M.	o Piscium.....	43 23·5	43 52	10 44 19·5	44 47	45 15	10 44 19·4			
—	(240) Arietis..	.....	1 18	11 1 45·5	2 13·5	.....	11 1 45·67			
—	☽'s 1st Limb .	5 57·5	6 26·5	11 6 55	7 23·5	7 52	11 6 54·92			
—	ζ' Ceti	10 54	11 22	11 11 50	12 17	12 45	11 11 49·6			
—	α „	0 10·5	0 38·5	12 1 6	1 33	2 1	12 1 5·83			
10	α Andromedæ .	2 55·5	3 27	9 3 58·5	4 29	5 0	9 3 58			
P.M.	γ Pegasi	7 52·5	8 21·2	9 8 49·5	9 17·5	9 46	9 8 49·37			
—	(38) Arietis...	38 42·5	39 11	11 39 39	40 7	40 35	11 39 38·9			
—	α Ceti	56 22·5	56 50·5	11 57 18	57 45	58 13	11 57 17·83			
—	☽'s 1st Limb .	2 40	3 9·7	12 3 38·5	4 7·7	4 36·7	12 3 38·52			
12	Castor	22 1·5	22 35	4 23 7·5	23 39	24 11·8	4 23 7·05			
A.M.	Procyon	28 49·5	29 17·5	4 29 45	30 12·5	30 40	4 29 44·92			
—	Pollux	33 11·5	33 43·5	4 34 15	34 46	35 17	4 34 14·67			
		Commencement of Experiments with Iron Pendulum (2d Series).								
14	☽'s 2d Limb .	56 9 5	56 40	2 57 10	57 39·5	58 9·5	2 57 9·75	0 52 48·94	3 49 58·69	
A M.	Sirius	28 35·5	29 5	3 29 33·5	30 2	30 30·5	3 29 33·33	0 52 50·24	4 22 23·57	
—	Castor	14 25·7	14 58·8	4 15 31·5	16 3·5	16 35·5	4 15 31·08	0 52 52·06	5 8 23·14	
—	Procyon	21 13·5	21 41·5	4 22 9·5	22 36·5	23 4·5	4 22 9·17	0 52 52·33	5 15 1·5	
—	Pollux	.....	26 8	4 26 39·5	27 10·2	.....	4 26 39·42	0 52 52·5	5 19 31·92	
—	⊙'s 1st Limb	6 2	6 31·5	0 7 0·5	7 29	7 58	0 8 8·5	0 53 11·01	1 1 19·51	
	⊙'s 2d Limb	8 18·5	8 48	0 9·17	9 45·5	10 14·5				

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Appendix. Table II.—Cape of Good Hope.

1829.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
Nov. 14	β Aquarii.....	11 13	11 41	6 12 8 5	12 36	13 3·5	6 12 8·4	0 53 25·7	7 5 34·1
P.M.	α Pegasi.....	44 39·5	45 8	7 45 37	46 4·5	46 33	7 45 36·4	0 53 29·4	8 39 5·8
—	α Andromedæ .	47 43·5	48 15·5	8 48 46·8	49 17	49 48·5	8 48 46·26	0 53 31·93	9 42 18·19
—	γ Pegasi	52 40·5	53 10	8 53 38	54 6·5	54 35	8 53·38	0 53 32·13	9 47 10·13
15	Sirius	24 48	25 17	3 25 45·5	26 14	26 42·5	3 25 45·42	0 53 47·8	4 19 33·22
A.M.	☽'s 2d Limb ..	50 24	50 54	3 51 24	51 53·2	52 23	3 51 23·7	0 53 48·83	4 45 12·53
—	δ Geminorum .	56 59	57 29·5	3 57 59	58 28	58 57·7	3 57 58·64	0 53 49·09	4 51 47·73
—	Castor	10 38	11 11	4 11 43	12 15·5	12 48	4 11 43·08	0 53 49·64	5 5 32·72
—	Procyon	17 26	17 54	4 18 21·5	18 49	19 16·5	4 18 21·42	0 53 49·91	5 12 11·33
—	Pollux	21 48	22 20	4 22·51	23 22	23 53·5	4 22 50·92	0 53 50·09	5 16 41·01
—	α Hydræ	5 57·5	6 25·5	6 6 53·5	7 21	7 48·5	6 6 53·25	0 53 54·75	7 0 48
Noon	☉'s 1st Limb	6 19·5	6 49·2	0 7 18·5	7 47·2	8 16	0 8 26·59	0 54 8·84	1 2 35·43
	☉'s 2d Limb	8 36·2	9 6	0 9 35·5	10 4	10 33			
P.M.	α Aquilæ	.....	.....	4 28 29·5	28 57	29 24·5	4 28 29·44	0 54 19·35	5 22 48·79
—	γ Pegasi	.....	.....	8 49 51	50 18·5	50 46·5	8 49 50·52	0 54 29·74	9 44 20·26
16	Sirius..... ...	20 59·5	21 29	3 21 57·5	22 25·2	22 54·5	3 21 57·2	0 54 45·47	4 16 42·67
A.M.	Castor	6 50	7 23	4 7 55·5	8 28	9 0·5	4 7 55·42	0 54 47·29	5 2 42·71
—	Procyon.....	13 39·5	14 6	4 14 34	15 1·2	15 29	4 14 33·95	0 54 47·54	5 9 21·49
—	Pollux	18 0·5	18 32·2	4 19 3·5	19 34·5	20 6	4 19 3·37	0 54 47·68	5 13 51·05
—	☽'s 2d Limb..	41 58·8	42 28·8	4 42 58·2	43 27	43 56·5	4 42 57·92	0 54 48·67	5 37 46·59
—	α Hydræ	2 9·5	2 38	6 3 5·5	3 33	4 0·5	6 3 5·33	0 54 51·94	6 57 57·27
—	Regulus.....	42 6·5	42 35·5	6 43 3·5	43 31·2	43 59·5	6 43 3·28	0 54 53·52	7 37 56·8
	Sun obscured at	noon by clouds.							
P.M.	α Aquilæ	23 45·7	24 14	4 24 42	25 9·2	25 37	4 24 41·58	0 55 16·83	5 19 58·41
—	β Aquarii.....	3 37·5	4 5·5	6 4 33·5	5 0·5	5 28·2	6 4 33·04	0 55 20·78	6 59 53·82
—	α „	37 59·7	38 27·5	6 38 55·2	39 22	39 49·5	6 38 54·78	0 55 22·12	7 34 16·9
—	α Pegasi	37 4	37 32·8	7 38 1·5	38 29·5	38 58	7 38 1·16	0 55 24·42	8 33 25·58
—	α Andromedæ .	40 8·5	40 40	8 41 11·5	41 42	42 13·5	8 41 11·1	0 55 26·89	9 36 37·99
—	γ Pegasi	45 5·5	45 34	8 46 2·5	46 30·5	46 59	8 46 2·3	0 55 27·08	9 41 29·38
17	Castor	3 2·5	3 36	4 4 8	4 40·5	5 13	4 4 8	0 55 44·51	4 59 52·51

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A.M.	Procyon	9 51	10 18·5	4 10 46·2	11 14	11 41·5	4 10 46·23	0 55 44·78	5 6 31·01
—	Pollux	14 13·5	14 44·5	4 15 16	15 47	16 18·5	4 15 15·92	0 55 44·97	5 11 0·89
—	☽'s 2d Limb ..	30 47	31 16·2	5 31 45·5	32 14	32 43	5 31 45·2	0 55 48·02	6 27 33·22
—	α Hydræ	58 22·2	58 50·5	5 59 18·5	59 45·5	60 13·5	5 59 18·12	0 55 49·13	6 55 7·25
—	Regulus	38 19·5	38 48	6 39 16·5	39 44	40 12·5	6 39 16·17	0 55 50·7	7 35 6·87
Noon	⊙'s 1st Limb	6 58·5	7 28	0 7 57·5	8 26	8 55·2	0 9 5·65	0 56 3·88	1 5 9·53
	⊙'s 2d Limb	9 15·5	9 45	0 10 14·4	10 43·2	11 12·5			
18	☽'s 2d Limb ..	17 3·2	17 32·5	6 18 0·5	18 29	18 57·7	6 18 0·57	0 56 47·4	7 14 47·97
A.M.	Regulus	34 32·5	35 1	6 35 29	35 57	36 25	6 35 28·92	0 56 48·14	7 32 17·06
Noon	⊙'s 1st Limb	.....	.....	.....	8 47	9 16·2	0 9 26·63	0 57 1·29	1 6 27·92
	⊙'s 2d Limb	9 37	10 6	0 10 35·5	11 4	.....			
P.M.	β Aquarii	.....	.....	5 — —	.....	57 53·5	5 56 58·45	0 57 14·99	6 54 13·44
—	α „	30 24·5	30 52·5	6 31 20·2	31 47·5	32 15	6 31 19·94	0 57 16·39	7 28 36·33
—	α Pegasi	29 29·5	29 58·5	7 30 26·5	30 54·5	31 23	7 30 26·4	0 57 18·69	8 27 45·09
—	α Andromedæ .	32 34	33 5·5	8 33 37	34 8	34 38·5	8 33 36·67	0 57 21·15	9 30 57·82
—	γ Pegasi	37 30·5	37 59·5	8 38 28	38 56	39 24	8 38 27·67	0 57 21·36	9 35 49·03
19	Castor	55 28	56 1	3 56 33·5	57 5·5	57 38·5	3 56 33·33	0 57 38·72	4 54 12·05
A.M.	Pollux	6 38·5	7 10	4 7 41	8 12·5	8 43·5	4 7 41·08	0 57 39·18	5 5 20·26
—	α Hydræ	50 48	51 16	5 51 43·8	52 11·5	52 39	5 51 43·68	0 57 43·34	6 49 27·02
—	Regulus	30 45	31 13·8	6 31 42	32 9·7	32 38	6 31 41·75	0 57 44·9	7 29 26·65
—	☽'s 2d Limb ..	1 19·5	1 48	7 2 16·5	2 44·5	3 12·5	7 2 16·25	0 57 46·1	8 0 2·35
Noon	⊙'s 1st Limb	7 41	8 10·7	0 8 40	9 8·5	9 37·7	0 9 48·62	0 57 58·43	1 7 47·05
	⊙'s 2d Limb	9 58·5	10 28·5	0 10 58	11 26·5	11 56			
P.M.	β Aquarii	.....	.....	5 53 11	53 38·5	54 6	5 53 11·06	0 58 12·09	6 51 23·15
—	α Pegasi	25 42·2	26 11	7 26 39	27 7	27 35·5	7 26 38 94	0 58 15·76	8 24 54·7
—	α Andromedæ .	28 46	29 18	8 29 49·5	30 20	30 51·5	8 29 49 08	0 58 18·25	9 28 7·33
—	γ Pegasi	33 43	34 12	8 34 40·5	35 8·5	35 37	8 34 40·25	0 58 18·44	9 32 58·69
20	Castor	51 40·5	52 13·5	3 52 46·5	53 18·5	53 51	3 52 46·08	0 58 35·75	4 51 21·83
A.M.	Procyon	58 29	58 57·2	3 59 25	59 52	0 19·5	3 59 24·62	0 58 36·02	4 58 0·64
—	Pollux	2 51·5	.....	4 3 54·5	.....	.....	4 3 54·36	0 58 36·2	5 2 30·56
Noon	⊙'s 1st Limb	8 4	8 33·5	0 9 3	9 32	10 0·7	0 10 11 64	0 58 55·45	1 9 7·09
	⊙'s 2d Limb	10 21·5	10 51·5	0 11 21	11 49·5	12 19			

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1829.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
Nov. 20	α Aquilæ	8 36·5	9 4·5	4 9 32·5	10 0	10 27·5	4 9 32·25	0 59 4·87	5 8 37·12
P.M.	α Aquarii	22 50·5	23 18·2	6 23 45·7	24 12·5	24 40·5	6 23 45·48	0 59 10·33	7 22 55·81
—	α Pegasi.....	21 55	22 24.	7 22 52·2	23 20	23 48·5	7 22 51·94	0 59 12·68	8 22 4·62
—	α Andromedæ .	24 59·5	25 31	8 26 2·5	26 33	27 4	8 26 2·08	0 59 15·17	9 25 17·25
—	γ Pegasi.....	29 56·5	30 25	8 30 53·5	31 21·5	31 50	8 30 53·33	0 59 15·37	9 30 8·7
21	Castor	47 54	48 27	3 48 59	49 31	50 3·5	3 48 58·92	0 59 32·84	4 48 31·76
A.M.	Procyon.....	54 42	55 9·5	3 55 37	56 5	56 32·5	3 55 37·17	0 59 33·06	4 55 10·23
—	Pollux	59 4	59 35·5	4 0 7	0 37·5	1 9	4 0 6·67	0 59 33·17	4 59 39·84
—	Regulus.....	23 10·5	23 39	6 24 7·5	24 35	25 3·5	6 24 7·17	0 59 39·02	7 23 46·19
—	☽'s 2d Limb..	26 37·7	27 6	8 27 34·5	28 2	28 30·2	8 27 34·15	0 59 43·8	9 27 17·95
Noon	⊙'s 1st Limb	8 27·7	8 57·5	0 9 27	9 55·5	10 25	0 10 35·52	0 59 52·65	1 10 28·17
	⊙'s 2d Limb	10 45·5	11 15·5	0 11 44·5	12 13·5	12 43			
P.M.	α Aquilæ	4 48·5	5 17	4 5 45	6 12·2	6 40	4 5 44·62	1 0 2·08	5 5 46·7
—	α Aquarii	19 2·5	19 30·5	6 19·58	20 25	20 52·5	6 19 57·7	1 0 7·4	7 20 5·1
—	α Pegasi.....	18 7	18 35·5	7 19 4·5	19·32	20 0·5	7 19 3·9	1 0 9·76	8 19 13·66
—	α Andromedæ .	21 12	21 43·2	8 22 14·5	23 45·5	23 16·5	8 22 14·37	1 0 12·22	9 22 26·59
—	γ Pegasi.....	26 9	26 37·5	8 27 6	27 34	28 2·5	8 27 5·83	1 0 12·41	9 27 18·24
22	Castor	44 6·5	44 39	3 45 11·5	45 43·5	46 16	3 45 11·3	1 0 29·8	4 45 41·1
A.M.	Procyon.....	50 54	51 22	3 51 49·5	52 17	52 44·5	3 51 49·4	1 0 30·06	4 52 19·46
—	Pollux	.....	55 48	3 56 19·5	56 50·5	57 21·5	3 56 19·42	1 0 30·23	4 56 49·65
—	Regulus.....	19 23	19 52	6 20 19·5	20 47·5	21 15·5	6 20 19·5	1 0 35·97	7 20 55·47
Noon	⊙'s 1st Limb	8 51·7	9 21·5	0 9·51	10 20	10 49	0 10 59·81	1 0 49·87	1 11 49·68
	⊙'s 2d Limb	11 10	11 40	0 12·9	12 38	13 7·5			
P.M.	α Aquilæ	.....	1 29·5	4 1 57·5	2 25	2 52·5	4 1 57·4	1 0 59·1	5 2 56·5
—	α Aquarii	15 15	15 43	6 16 10·5	16 37·5	17 5	6 16 10·2	1 1 4·45	7 17 14·65
—	α Pegasi.....	14 19·5	14 48	7 15 16·5	15 44·5	16 13	7 15 16·3	1 1 6·78	8 16 23·08
—	α Andromedæ .	17 24·0	17 55·5	8 18 26·5	18 57	19 28	8 18 26·2	1 1 9·31	9 19 35·51
—	γ Pegasi.....	22 20·5	22 49·5	8 23 18	23 46	24 14·2	8 23 17·64	1 1 9·46	9 24 27·1
23	Sirius	54 28	54 57	2 55 26	55 54	56 22·5	2 55 25·58	1 1 25·19	3 56 50·77

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December 7	ζ Ceti	7 17·5	7 36·2	2 7 55·2	8 14·4	8 33	2 7 55·26	By large Transit; rate of Clock on Sid. Time + 0ˢ·8.	
A.M.	☽'s 1st Limb..	35 6·4	35 26·2	2 35 45·9	36 5·2	36 24·9	2 35 45·72		
—	σ Arietis.....	45 24	45 43·6	2 46 2·9	46 22·1	46 41·2	2 46 2·76		

St. Helena.

1830.

January 5	Capella	31 20·4	32 0·2	11 32 40	33 19	33 58	11 32 39·40	By Chron. 799.	
—	Rigel	.....	34 27·2	11 34 54·4	35 22·3	35 49·2	11 34 54·8		
	Occultation of a small bright Star by the Moon's dark Limb at 10ʰ 59ᵐ 26ˢ (by 799).								
			Commencement of Experiments with No. 10 Pendulum.						
6	α Ceti	.....	57 4·5	9 57 32	57 58·5	58 26	9 57 31·67	2 27 57·96	7 29 33·71
—	α Persei	.....	15 38	10 16 20	17 1·5	17 43·8	10 16 19·83	2 27 59·47	7 48 20·36
—	η Tauri	.....	40 55·5	10 41 25	41 54·5	42 24·5	10 41 25	2 28 1·47	8 13 23·53
—	γ „	13 7	13 35·8	11 14 4	14 32	15 0·5	11 14 3·86	2 28 4·11	8 45 59·75
—	δ² „	.....	17 45·6	11 18 14	18 42	19 11	11 18 13·87	2 28 4·42	8 50 9·45
—	ε „	21 38·5	22 8	11 22 36·5	23 5·5	23 34·5	11 22 36·6	2 28 4·77	8 54 31·83
—	Aldebaran	29 6·5	29 35·5	11 30 4	30 32	31 0·5	11 30 3·7	2 28 5·32	9 1 58·38
—	Capella	6 38·5	7 18·5	12 7 58	8 36·5	clouded	12 7 57·67	2 28 8·32	9 39 49·35
—	Rigel	.....	9 41	12 10 9	10 36·5	11 4·5	12 10 8·83	2 28 8·52	9 42 0·31
—	☽'s 1st Limb..	14 3	14 33·5	12 15 3·5	15 32·5	16 2·5	12 15 3	2 28 8·91	9 46 54·09
7	☉'s 1st Limb	.....	.....	2 — —	13 39·5	14 9·5	2 14 20·24	2 29 15·08	11 45 5·16
	☉'s 2d Limb	14 31·2	15 1	2 15 31	16 0	16 30			
P.M.	α Ceti	.....	.....	9 — —	54 10·5	54 38	9 53 43·28	2 29 50·99	7 23 52·29
—	α Persei	11 6·5	11 49	10 12 31·2	13 12·5	13 54·5	10 12 30·74	2 29 52·53	7 42 38·21
—	δ „	29 44·5	30 25·5	10 31 6	31 46	32 26·5	10 31 5·7	2 29 53·96	8 1 11·74
—	η Tauri	36 35·5	37 6	10 37 36	38 5·5	38 35	10 37 35·6	2 29 54·48	8 7 41·12
—	γ „	9 18	9 46·5	11 10 15	.....	.....	11 10 15·2	2 29 57·12	8 40 18·08
—	ε „	17 50	18 19	11 18 47·5	19 16·5	19 45·5	11 18 47·7	2 29 57·8	8 48 49·9
—	Aldebaran	25 17·5	25 46·5	11 26 15	26 43	27 12	11 26 14·8	2 29 58·38	8 56 16·42
—	Rigel	.....	5 53	12 6 20·8	6 47·5	7 15·5	12 6 20·43	2 30 1·54	9 36 18·89
—	ζ Orionis	31 10	31 38·5	12 32 5·5	32 32·5	32 59·5	12 32 5·2	2 30 3·59	10 2 1·61

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
January 7	α Orionis	44 54·5	45 23	12 45 50·5	46 17·5	46 45·5	12 45 50·2	2 30 4·69	10 15 45·51
P.M.	β Aurigæ	.....	.....	12 — —	47 35	48 13·5	12 46 54·25	2 30 4·77	10 16 49·48
—	E' Orionis	.....	.....	13 1 47·4	2 15·5	2 45	13 1 46·97	2 30 5·95	10 31 41·02
—	☽'s 1st Limb..	9 16·5	9 47	13 10 16·5	10 46	11 15·5	13 10 16·3	2 30 6·62	10 40 9·68
—	(21)Geminorum	21 11	21 40·5	13 22 9·5	22 38	23 6·8	13 22 9·16	2 30 7·56	10 52 1·6
—	γ „	26·42	27 10	13 27 39	28 7	28 35·5	13 27 38·7	2 30 7·99	10 57 30·71
—	u „	31 17·5	31 46·5	13 32 15	32 43·5	33 12·5	13 32 15	2 30 8·36	11 2 6·64
8	⊙'s 1st Limb	12 43·5	13 13·5	2 13 43·2	14 13·5	14 42			
Noon	⊙'s 2d Limb	15 4	15 34·5	2 16 4	16 33·2	17 3·2	2 14 53·46	2 31 8·73	11 43 44·73
P.M.	α Ceti	48 58·5	49 26	9 49 53·4	49 20·5	50 48·5	9 49 53·38	2 31 44·49	7 18 8·89
—	α Persei	7 17·5	8 0·5	10 8 42·5	9 23·5	10 5·5	10 8 41·9	2 31 45·98	7 36 55·92
—	δ „	25 55·5	26 37	10 27 17	27 57	28 37·5	10 27 16·8	2 31 47·46	7 55 29·34
—	η Tauri	32 47	33 17·5	10 33 47·5	34 17	34 47	10 33 47·2	2 31 47·96	8 1 59·24
—	γ „	5 29	5 57·5	11 6 26	6 54	7 23	11 6 25·9	2 31 50·66	8 34 35·24
—	ε „	14 0·5	14 30	11 14 59	15 28	15 57	11 14 58·9	2 31 51·25	8 43 7·65
—	Aldebaran	21 28·5	21 57·5	11 22 26	22 54·5	23 23·3	11 22 25·96	2 31 51·84	8 50 34·12
—	Capella	.....	59 40·5	12 — —	0 59	.....	12 0 19·75	2 31 54·81	9 28 24·94
—	Rigel	.....	2 4	12 2 31·8	2 59·2	.....	12 2 31·67	2 31 54·99	9 30 36·68
—	α Orionis	41 5·6	41 34	12 42 2	0 29	0 57	12 42 1·52	2 31 58·11	10 10 3·41
9	⊙'s 1st Limb	.....	.....	2 14 16	14 45	15 14·8			
	⊙'s 2d Limb	15 36·2	16 6·2	2 16 36	17 5·5	17 35·5	2 15 25·61	2 33 2·19	11 42 23·42
P.M.	α Ceti	45 10·5	45 38	9 46 6	46 33	47 0·5	9 46 5·54	2 33 37·56	7 12 27·98
—	α Persei.....	3 28·5	4 11	10 4 53·5	5 35	6 17	10 4 53	2 23 39·04	7 31 13·96
—	δ „	22 7	22 47·7	10 23 28·2	24 8	24 48·5	10 23 27·88	2 33 40·53	7 49 47·35
—	η Tauri.....	28 58·5	29 28·5	10 29 58·5	30 28	30 58	10 29 58·3	2 33 41·05	7 56 17·25
—	γ „	1 40·5	2 9	11 2 37·5	3 5·5	3 34	11 2 37·3	2 33 43·61	8 28 53·69
—	ε „	10 11·7	10 41·5	11 11 10·5	11 39·2	12 8	11 11 10·18	2 33 44·29	8 37 25·89
—	Aldebaran	17 40·5	18 9	11 18 37·5	19 6	19 34·5	11 18 37·5	2 33 44·89	8 44 52·61
—	Capella	55 11·7	55 52	11 56 31·5	57 10	57 50	11 56 31·04	2 33 47·92	9 22 43·12
—	Rigel	.....	58 16	11 58 43·2	59 10·5	59 38·5	11 58 43·23	2 33 48·1	9 24 55·13

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APPENDIX. TABLE II.—St. Helena.

—	β Tauri	6 50·5	7 22	12 7 53·2	8 24	8 55·5	12 7 53·04	2 33 48·74	9 34 4·8
—	δ Orionis	18 57·5	19 25·5	12 19 53	20 20·5	20 47·5	12 19 52·8	2 33 49·7	9 46 8·1
—	ε „	14 42·5	15 10·5	12 15 38	16 5	16 32·5	12 15 37·7	2 33 49·36	9 41 48·34
—	ξ „	23 32·5	24 0·5	12 24 28	24 55	25 22·5	12 24 27·7	2 33 50·05	9 50 37·65
—	α „	37 17·5	37 45·6	12 38 13·5	38 40·4	39 8·5	12 38 13·1	2 33 51·15	10 4 21·95
—	β Aurigæ	.....	.....	12 — —	.....	40 36·5	12 39 19·27	2 33 51 24	10 5 28·03
10	⊙'s 1st Limb	.....	.....	2 — —	15 17·5	15 47·5			
	⊙'s 2d Limb	16 8·2	16 38·8	2 17 8·5	17 37·5	18 7·5	2 15 57·92	2 34 55·69	11 41 1·95
P.M.	α Ceti	41 21·5	41 49·2	9 42 17·5	42 44·5	43 12	9 42 16·94	2 35 30·65	7 6 46·29
—	α Persei	59 40·5	0 23·5	10 1 5·5	1 47	2 29	10 1 5·1	2 35 32·14	7 25 32·96
—	δ „	18 18·5	18 59·8	10 19 40·5	20 20	21 0·5	10 19 39·86	2 35 33·68	7 44 6·18
—	η Tauri	25 9·6	25 40·5	10 26 10·5	26 40	27 10	10 26 10·12	2 35 34·15	7 50 35·97
—	Capella.....	.....	.....	11 — —	.....	54 0·5	11 52 41·83	2 35 40·96	9 17 0·87
—	Rigel	.....	.....	11 — —	.....	55 50·2	11 54 54·91	2 35 41·14	9 19 13·77
—	β Tauri	.....	3 33·5	12 4 4·5	4 35·5	.....	12 4 4·5	2 35 41·85	9 28 22·65
—	δ Orionis	10 58·7	11 21·8	12 11 49·5	12 16	12 43·5	12 11 48·9	2 35 42·36	9 36 6·54
—	ε „	15 11	15 37	12 16 4·5	16 31·5	16 59	12 16 4·6	2 35 42·78	9 40 21·82
—	ζ „	19 43·5	20 11·8	12 20 39	21 6·5	21 34	12 20 38·96	2 35 43·14	9 44 55·82
—	α „	33 28·5	33 57	12 34 25	34 52	35 20	12 34 24·5	2 35 46·3	9 58 40·2
—	β Aurigæ	.....	.....	12 — —	36 9	36 47·6	12 35 30·54	2 35 44·39	9 59 46·15
11	⊙'s 1st Limb	14 19·5	14 49·8	2 15 19·8	15 48·5	16 18·5			
	⊙'s 2d Limb	.....	.....	.....	18 9	.....	2 16 29·45	2 36 48·87	11 39 40·58
P.M.	α Ceti	37 33·2	38 1	9 38 28·5	38 55·5	39 23	9 38 28·24	2 37 23·55	7 1 4·69
—	δ Persei	.....	.....	10 15 51	.....	.....	10 15 51	2 37 25·45	7 38 25·55
—	η Tauri	21 21	21 51·5	10 22 21·5	22 51	23 21	10 22 21·2	2 37 27·01	7 44 54·19
—	γ „	.....	54 32·5	10 55 1	55 29	55 57·5	10 55 0·83	2 37 29·3"	8 17 31·23
—	ε „	2 35	3 4·5	11 8 33·5	4 2	4 31·5	11 3 33·3	2 37 30·27	8 26 3·03
—	Aldebaran	10 3	10 32	11 11 0·8	.....	.....	11 11 0·77	2 37 30·83	8 33 29·94
—	Capella.....	47 34	48 14·5	11 48 54·5	49 33	50 12	11 48 53·6	2 37 33·82	9 11 19·78
—	Rigel	.....	.....	11 — —	51 34	.....	11 51 6·62	2 37 34	9 13 32·62
—	β Tauri	.....	.....	12 0 16·5	0 47	1 17·7	12 0 16·06	2 37 34·7	9 22 41·36
—	δ Orionis	7 5·5	7 33·5	12 8 1	8 28	8 55·5	12 8 0·7	2 37 35·32	9 30 25·38

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
January 11	ε Orionis	11 20·5	11 48·5	12 12 16·2	12 43	13 10·5	12 12 15·74	2 37 35·54	9 34 40·2
P.M.	ζ „ '	15 55·5	16 23·5	12 16 51	17 18·2	17 45·5	12 16 50·74	2 37 35·95	9 39 14·79
—	α „	29 40	30 8	12 30 36·5	31 3·5	31 31·5	12 30 35·9	2 37 37·1	9 52 58·8
—	β Aurigæ	.....	.....	12 — —	32 20	32 59	12 31 41·49	2 37 37·18	9 54 4·34
		Commencement of Experiments with No. 11 Pendulum.							
12	⊙'s 1st Limb	.....	.....	2 — —	.....	16 49·2	2 16 59·99	2 38 42·14	11 38 17·85
	⊙'s 2d Limb	17 10·5	17 40·8	2 18 10·5	18 40	19 9			
P.M.	α Ceti	.....	.....	9 34 40	.....	.....	9 34 40	2 39 16·59	6 55 23·41
—	α Persei	.....	.....	9 53 28·5	.....	.....	9 53 28·5	2 39 18·09	7 14 10·41
—	δ „	10 41·5	11 23	10 12 3·2	12 43·2	13 23·5	10 12 2·88	2 39 19·5	7 32 43·38
—	η Tauri.....	17 32·8	18 3·5	10 18 33·5	19 3·2	19 33	10 18 33·2	2 39 20·16	7 39 13·04
—	γ „	50 14·5	50 43·2	10 51 12	.....	.....	10 51 11·94	2 39 22·39	8 11 49·55
—	ε „	.....	59 15·5	10 59 45	0 13·5	.....	10 59 44·67	2 39 23·36	8 20 21·31
—	Aldebaran	6 14·5	6 43·5	11 7 12	7 40·5	8 9	11 7 11·9	2 39 23·9	8 27 48
—	Rigel	.....	46 50·2	11 — —	.....	.....	11 47 17·97	2 39 27·09	9 7 50·88
—	δ Orionis	.....	.....	12 — —	4 39·4	5 7	12 4 12·3	2 39 28·36	9 24 43·94
—	ε „	7 32	7 59·6	12 8 27·5	8 54·5	9 22	12 8 27·12	2 39 28·7	9 28 58·42
—	ζ „	12 6·7	12 34·5	12 13 2	13 29·5	13 56·5	12 13 1·84	2 39 29·06	9 33 32·78
13	⊙'s 1st Limb	15 20·5	15 50·7	2 16 20·5	16 50	17 19	2 17 30·14	2 40 35·56	11 36 54·58
	⊙'s 2d Limb	17 40·5	18 10·5	2 18 40·5	19 10	19 39·2			
P.M.	No Stars observed this evening; the weather after sunset became dark, and the sky densely overcast with but very little rain fell.								rain clouds,
14	Sun obscured at noon; sky densely overcast.								
P.M.	α Ceti	26 7	26 35	9 27 2·8	27 29·7	27 57·5	9 27 2·4	2 43 2·5	6 43 59·9
—	α Persei	44 26	45 8·5	9 45 51	46 32·5	47 14·5	9 45 50·5	2 43 3·94	7 2 46·56
—	δ „	3 4	3 45	10 4 25·5	5 5·5	5 46	10 4 25·2	2 43 5·41	7 21 19·79
—	η Tauri.....	9 55·5	10 26	10 10 56	11 25·5	11 55·5	10 10 55·7	2 43 5·93	7 27 49·77
—	γ „	42 37	43 6·2	10 — —	44 3	44 31	10 43 34·3	2 43 8·49	8 0 25·81
—	ε „	51 8·7	51 38·5	10 52 7·5	12 36	53 5·4	10 52 7·22	2 43 9·15	8 8 58·07
—	Aldebaran	58 37	59 6·4	10 59 35	0 3	.....	10 59 34·8	2 43 9·7	8 16 25·1

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—	Capella	36 8·6	36 49	11 — —	38 7	38 47	11 37 27·9	2 43 12·75	8 54 15·15
—	Rigel	.....	39 13	11 39 40·5	.....	.....	11 39 40·5	2 43 12·93	8 56 27·57
—	β Tauri.....	47 46·5	48 18·5	11 48 50	49 20·7	49 52	11 48 49·54	2 43 13·67	9 5 35·87
—	δ Orionis	55 39·5	56 7·5	11 56 35	57 2	57 29·5	11 56 34·7	2 43 14·3	9 13 20·4
—	ε „	59 54·5	0 22	12 0 50	1 17·5	1 44·7	12 0 49·74	2 43 14·5	9 17 35·24
15	Neither Sun nor Stars observable; sky generally overcast with dark heavy clouds; weather very sultry.								
16	⊙'s 1st Limb .	16 47·5	.....	2 17 47	18 16·5	18 45·7	2 18 56·6	2 46 15·09	11 32 41·51
P.M.	No Stars observable; sky densely overcast.								
17	Sun obscured at time of passing the meridian.								
P.M.	δ Persei	51 37	52 18·5	9 52 59	53 38·2	54 19	9 52 58·34	2 48 43·43	7 4 14·91
—	η Tauri.....	58 28·5	58 59	9 59 29	59 58·5	0 29	9 59 28·8	2 48 43 93	7 10 44·87
—	γ „	31 10·5	31 39·5	10 32 8·5	32 36·5	33 4·8	10 32 7·96	2 48 46·46	7 43 21·5
—	ε „	39 43	40 12·2	10 40 41·5	41 9·8	41 39	10 40 41·1	2 48 47·15	7 51 53·95
—	Aldebaran	47 10·7	47 40	10 48 8·5	48 37	49 5·5	10 48 8·34	2 48 47·72	7 59 20·62
—	Capella.....	24 41·5	25 22	11 26 2	26 40·5	27 20	11 26 1·2	2 48 50·75	8 37 10·45
—	Rigel	.....	27 46·5	11 28 14	28 41·5	29 9·2	11 28 14	2 48 50·92	8 39 23·08
—	β Tauri	36 20·8	.....	11 — —	.....	.....	11 37 24·04	2 48 51·65	8 48 32·39
—	δ Orionis	44 13	44 40·8	11 — —	.....	.....	11 45 8·43	2 48 52·35	8 56 16·08
—	ε „	48 28·2	48 56·5	11 49 23·8	49 51	50 18·5	11 49 23·6	2 48 52·59	9 0 31·01
—	ζ „	53 3·5	53 31·2	11 53 59	54 25·7	54 53·2	11 53 58·52	2 48 52·96	9 5 5·56
—	α „	6 48	7 16·2	12 7 44	8 11·2	8 39·5	12 7 43·78	2 48 53·94	9 18 49·84
18	⊙'s 1st Limb	.....	18 11·2	2 18 41·2	19 10	19 39·5	2 19 50·36	2 50 0·88	11 29 49·48
	⊙'s 2d Limb	20 1	20 31	2 21 0·2	21 29·2	21 58·5			
	Commencement of Experiments with Convertible Pendulums.								
22	⊙'s 1st Limb	.....	19 51	2 20 20	20 49·2	21 18	2 21 28·92	4 43 23·26	9 38 5·66
	⊙'s 2d Limb	21 39·2	22 9	2 22 38·5	23 7	23 36·5			
P.M.	α Ceti	55 35·5	56 3·5	8 56 31	56 58·5	57 26	8 56 30·9	4 43 20·63	4 13 10·27
—	α Persei.....	13 55·5	14 38	9 15 20	16 1·5	16 43·5	9 15 19·7	4 43 20·54	4 31 59·16
—	δ „	32 33	33 14·5	9 33 54·5	34 34·5	35 14·5	9 33 54·2	4 43 20·35	4 50 33·85
—	η Tauri.....	.....	39 54·2	9 40 24·5	.....	41 24·5	9 40 24·5	4 43 20·31	4 57 4·19
—	γ „	12 6	12 35	10 13 3·5	13 31·5	14 0	10 13 3·2	4 43 20·12	5 29 43·08
—	ε „	20 38	21 7·2	10 21 36·5	22 5	22 34	10 21 36·14	4 43 20·07	5 38 16·07

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
January 22	Aldebaran	28 6	28 35	10 29 4·2	29 32	30 0·8	10 29 3·6	4 43 20·02	5 45 43·58
P.M.	Capella	5 37·5	6 17·5	11 6 57·5	7 36	8 15·9	11 6 56·88	4 43 19·8	6 23 37·08
—	Rigel	.....	8 41	11 9 9	9 36	10 4	11 9 8·67	4 43 19·79	6 25 48·88
—	β Tauri	.....	.....	11 18 19	18 50	19 21	11 18 18·99	4 43 19·73	6 34 59·26
—	δ Orionis	25 8	25 35·8	11 26 3·5	26 30·5	26 58	11 26 3·16	4 43 19·69	6 42 43·47
—	ε „	29 23	29 51	11 30 13·5	30 45·7	31 13·5	11 30 18·34	4 43 19·66	6 46 58·68
—	ζ „	33 58	34 26	11 34 53·5	35 21	35 48	11 34 53·3	4 43 19·61	6 51 33·69
—	α „	47 43·5	48 11·5	11 48 39	49 6·5	49 34	11 48 38·9	4 43 19·47	7 5 19·43
—	*	.....	50 15	11 50 49·2	51 23·5	51 58	11 50 49·23	4 43 19·48	7 7 29·75
23	⊙'s 1st Limb	19 44·5	20 14·2	2 20 43·5	21 12	21 41·5	2 21 52·06	4 43 14·1	9 38 37·96
	⊙'s 2d Limb	22 2·5	22 32	2 23 1·2	23 30	23 59·2			
P.M.	α Ceti	51 47·5	52 15·5	8 52 43	53 10	53 37·5	8 52 42·7	4 43 11·49	4 9 31·21
—	α Persei	10 5	10 48·5	9 11 30·5	12 11·5	12 54	9 11 29·9	4 43 11·44	4 28 18·46
—	δ „	28 43	29 24·5	9 30 5	30 44·5	31 25	9 30 4·4	4 43 11·27	4 46 53·13
—	η Tauri.....	35 35	36 6	9 36 36	37 5·5	37 35·5	9 36 35·6	4 43 11·23	4 53 24·37
—	γ „	8 17	8 46	10 9 14·5	9 42·5	10 11	10 9 14·2	4 43 10·92	5 26 3·28
—	ε „	16 49	17 18·5	10 17 47·5	18 16	18 45	10 17 47·2	4 43 10·87	5 34 36·33
—	Aldebaran	24 17	24 46	10 25 14·5	25 43	26 11·5	10 25 14·4	4 43 10·83	5 42 3·57
—	Capella.....	1 48·5	2 29	11 3 8·5	3 47·5	4 27	11 3 8·1	4 43 10·6	6 19 57·5
—	Rigel	.....	4 53	11 5 20·5	5 48	6 23·8	11 5 20·5	4 43 10·59	6 22 9·91
—	β Tauri	13 27·5	13 59·5	11 14 30·5	15 1·5	15 32·5	11 14 30·3	4 43 10·53	6 31 19·77
—	δ Orionis	21 20	21 48	11 22 15	22 42	23 10	11 22 15	4 43 10·49	6 39 4·51
—	ε „	25 35	26 3	11 26 30·5	26 57·5	27 25	11 26 30·2	4 43 10·46	6 43 19·74
—	ζ „	30 10·5	30 38	11 31 5·5	31 32·5	32 0	11 31 5·3	4 43 10·43	6 47 54·87
—	α „	43 54·5	44 23	11 44 50·5	45 18	45 45·5	11 44 50·3	4 43 10·35	7 1 39·95
—	*	.....	.....	11 47 1	.....	.....	11 47 1	4 43 10·34	7 3 50·66
24	⊙'s 1st Limb	.....	.....	2 21 6·5	21 35	22 4	2 22 14·63	4 43 4·74	9 39 9·89
	⊙'s 2d Limb	22 24·5	22 54·5	2 23 24	23 52·8	24 22			
P.M.	α Persei	6 17·5	7 0·5	9 7 42·5	8 24·5	9 6·5	9 7 42·3	4 43 4·94	4 24 40·36
—	δ „	24 56	25 36·5	9 26 17·5	26 57·5	27 37·5	9 26 17	4 43 1·83	4 43 15·17

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—	η Tauri.....	31 47·5	32 18	9 32 48	33 17·5	33 47·5	9 32 47·7	4 43 1·79	4 49 45·91
—	γ „	.....	4 58·5	10 5 27	5 54·5	6 23·5	10 5 26·67	4 43 1·61	5 22 25·06
—	ε „	13 1	13 30·5	10 14 0	14 28·5	14 57	10 13 59·4	4 43 1·57	5 30 57·83
—	Aldebaran	.....	20 58·5	10 21 27	21 55	22 24	10 21 26·83	4 43 1·52	5 38 25·31
—	Capella.....	58 0·5	58 40·5	10 59 20	59 59	60 38·5	10 59 19·7	4 43 1·29	6 16 18·41
—	Rigel	.....	1 4·5	11 1 32	1 59·5	2 27	11 1 32	4 43 1·26	6 18 30·74
—	β Tauri.....	9 39·5	10 11	11 10 42	11 13	11 44·5	11 10 42	4 43 1·21	6 27 40·79
—	δ Orionis	17 31·5	17 59·5	11 18 27	18 54	19 21·5	11 18 26·7	4 43 1·17	6 35 25·53
—	ε „	21 46·5	22 14·5	11 22 42	23 9	23 36·5	11 22 41·7	4 43 1·14	6 39 40·56
—	ζ „	26 21·5	26 49·5	11 27 17	27 44	28 11·5	11 27 16·5	4 43 1·11	6 44 15·39
—	α „	40 6	40 34	11 41 2	41 29·5	41 57·5	11 41 1·8	4 43 1·03	6 58 0·77
—	*	.....	42 37·5	11 43 12·5	43 46	44 20·5	11 43 12	4 43 1·02	7 0 10·98
25	⊙'s 1st Limb	.....	.....	2 — —	.....	22 26·5	2 22 38·55	4 42 55·54	9 39 43·01
	⊙'s 2d Limb	.....	.....	2 23 46	24 14·5	24 43·5			
P.M.	δ Persei	.....	21 48·5	9 22 29	23 9	23 49	9 22 28·83	4 42 52·45	4 39 36·38
—	η Tauri.....	27 59	28 29	9 28 59	29 29	29 59	9 28 59	4 42 52·41	4 46 6·59
—	ε „	.....	9 42·5	10 10 11·5	10 39·5	11 8·5	10 10 11·17	4 42 52·12	5 27 19·05
—	Aldebaran	16 40·5	17 10	10 17 38	18 6·5	18 35·5	10 17 38·1	4 42 52·07	5 34 46·03
—	Capella.....	54 12	54 52·5	10 55 31·5	56 10·5	56 50	10 55 31·3	4 42 51·8	6 12 39·5
—	ε Orionis	17 58·5	18 26·5	11 18 54	19 21	19 48·5	11 18 53·7	4 42 51·65	6 36 2·05
—	ζ „	22 33	23 0·5	11 23 28·5	23 55·5	24 23	11 23 28·1	4 42 51·61	6 40 36·49
27	⊙'s 1st Limb	.....	.....	2 22 9·5	22 38·5	23 8·2	2 23 17·55	4 42 37·03	9 40 40·52
	⊙'s 2d Limb	23 27·5	23 57	2 24 26·5	24 55	25 24			
P.M.	Aldebaran	.....	.....	10 10 2	10 30	10 58·5	10 10 1·77	4 42 33·8	5 27 27·97
—	Rigel	49 11	49 38·5	10 50 6·5	50 34	51 2	10 50 6·4	4 42 33·52	6 7 32·88
—	β Tauri	58 13·5	58 45·5	10 59 17	59 47·5	0 21	10 59 16·9	4 42 33·46	6 16 43·44
—	δ Orionis	6 6·2	6 34	11 7 1·5	7 28·5	7 56	11 7 1·24	4 42 33·41	6 24 27·83
—	ε „	10 21	10 49·5	11 11 16·5	11 43·5	12 11	11 11 16·3	4 42 33·38	6 28 42·92
—	ζ „	14 56	15 24	11 15 51·5	16 18·5	16 46·5	11 15 51·3	4 42 33·34	6 33 17·96
—	α „	28 41	29 9	11 29 37	30 4	30 32	11 29 36·6	4 42 33·25	6 47 3·35
—	*	.....	31 12·5	11 31 47	32 21	32 55·5	11 31 46·83	4 42 33·23	6 49 13·6
28	η Tauri	16 34	17 4·5	9 17 34·5	18 4	18 33·5	9 17 34·1	4 42 24·86	4 35 9·24

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
January 28	ε Tauri	57 47·5	58 17	9 58 46	59 14·5	59 43·5	9 58 45·7	4 42 24·57	5 16 21·13
P.M.	Aldebaran	5 15·5	5 44·5	10 6 13	6 41·5	7 9·5	10 6 12·8	4 42 24·52	5 23 48·28
—	Capella.....	42 46	43 27	10 44 6	44 45	45 24·5	10 44 5·7	4 42 24·26	6 1 41·44
—	Rigel	.....	45 50·5	10 46 18·5	46 45·5	47 13·5	10 46 18·17	4 42 24·24	6 3 53·93
—	β Tauri	54 25·5	54 57	10 55 28·5	55 59·5	56 30·5	10 55 28·2	4 42 24·18	6 13 4·02
—	δ Orionis	2 18	2 45·5	11 3 13	3 40	4 8·5	11 3 13	4 42 24·09	6 20 48·91
—	ε „	6 32·5	7 0·5	11 7 28·5	7 55·5	8 22·5	11 7 27·9	4 42 24·06	6 25 3·84
—	ζ „	11 8	11 35·5	11 12 3	12 30	12 57·5	11 12 2·8	4 42 24·03	6 29 38·77
—	α „	24 52	25 20·5	11 25 48	26 15·5	26 43	11 25 47·8	4 42 23·93	6 43 23·87
—	*	.....	27 23·5	11 27·58	28 32·5	29 6·5	11 27 58	4 42 23·92	6 45 34·08
				Ascension Island.					
February 26	β Aurigæ	.....	9 50	10 — —	.....	.....	10 10 28·81	3 36 29·94	6 33 58·87
—	Procyon.....	52 38	53 6·2	11 53 34	54 1	54 28·5	11 53 33·54	3 36 39·15	8 16 54·39
	Clouded evening.								
27	Arcturus.....	29 1·5	29 31·5	6 30 0·5	30 29·5	30 58·5	6 30 0·30	3 37 14·39	2 52 45·91
A.M.	Antares	39 42·5	40 13·5	8 40 44·5	41 14·5	41 45	8 40 44	3 37 25·99	5 3 18·01
P.M.	Capella	.....	23 10·5	9 23 50	24 28·5	25 8·5	9 23 49·67	3 38 33·62	5 45 16·05
—	β Tauri	34 10·5	34 42·5	9 35 14	35 44·5	36 15·5	9 35 13·4	3 38 34·66	5 56 38·74
—	δ Orionis	42 4	42 31·5	9 42 59	43 26	43 53·5	9 42 58·8	3 38 35·35	6 4 23.45
—	ε „	46 19	46 47	9 47 14·5	47 41·5	48 9	9 47 14·2	3 38 35·69	6 8 38·51
—	ζ „	50 54	51 21·5	9 51 49	52 16·5	52 43·2	9 51 48·84	3 38 36·11	6 13 12·73
—	β Aurigæ.....	5 21	6 0·5	10 6 39·5	7 18	7 56·5	10 6 39·1	3 38 37·41	6 28 1·69
—	γ Geminorum .	46 25	46 54	10 47 22·5	47 51	48 19·5	10 47 22·4	3 38 41·16	7 8 41·24
—	ε „ .	51 55	52 26	10 52 56·5	53 26·5	53 57	10 52 56·2	3 38 41·58	7 14 14·62
—	δ „ .	28 20	28 51	11 29 21	29 50	30 19·5	11 29 20·3	3 38 44·82	7 50 35·48
—	Castor	41 59·5	42 32·5	11 43 5	43 37	44 9·5	11 43 4·7	3 38 46·08	8 4 18·62
—	Procyon	48 48	49 16·5	11 49 43·5	50 11	50 38·5	11 49 43·5	3 38 46·68	8 10 56·82

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APPENDIX. *TABLE II.—Ascension Island.*

—	Pollux	53 11	53 41·5	11 54 13	.....	.....	11 54 13·31	3 38 47·05	8 15 26·26
28	δ Scorpii	.....	.....	8 8 18	8 46·5	9 16·5	8 8 17·56	3 39 31·02	4 28 46·54
A.M.	β "	12 34	13 3·5	8 13 33	14 1·8	14 30·5	8 13 32·56	3 39 31·5	4 34 1·06
—	Antares	35 53	36 24·5	8 36 55·5	37 25	37 56	8 36 54·8	3 39 33·58	4 57 21·22
P.M.	Capella	.....	.....	9 20 0·5	20 39	21 18·5	9 20 0·47	3 40 41·08	5 39 19·39
—	β Tauri	30 20·5	30 52	9 31 23·5	31 54	32 25·5	9 31 23·1	3 40 42·1	5 50 41
—	δ Orionis	38 13·5	38 41·5	9 39 9	39 36	40 3·5	9 39 8·7	3 40 42·89	5 58 25·81
—	ε "	42 29·2	42 57	9 43 24·5	43 51·2	44 18·5	9 43 24·08	3 40 43·07	6 2 41·01
—	ζ "	47 4	47 31·5	9 47 59	48 26	48 53·5	9 47 58·8	3 40 43·48	6 7 15·32
—	β Aurigæ	1 30·5	2 10·2	10 2 49·5	3 27·5	clouded	10 2 49·07	3 40 44·88	6 22 4·19
—	γ Geminorum	42 34·5	43 4	10 43 32·5	44 1	44 29·5	10 43 32·3	3 40 48·54	7 2 43·76
—	ε "	48 4·6	48 36	10 49 6·5	49 36·5	50 6·5	10 49 6·02	3 40 48·98	7 8 17·04
—	Castor	38 9·5	38 42	11 39 15	39 47	40 19·5	11 39 14·6	3 40 53·46	7 58 21·14
—	Procyon	44 57·5	45 26	11 45 53·5	46 20·5	46 48	11 45 53·1	3 40 54·06	8 4 59·04
—	Pollux	49 19·5	49 52	11 50 23	50 53·5	51 25	11 50 22·6	3 40 54·46	8 9 28·14
March 1	δ Scorpii	3 28·5	3 58·5	8 4 28	4 57	5 26·5	8 4 27·7	3 41 38·39	4 22 49·31
A.M.	β "	8 44·5	9 13·5	8 9 43	10 12	10 41	8 9 42·8	3 41 38·83	4 28 3·97
—	Antares	32 3·5	32 34·5	8 33 5	33 35·5	34 6	8 33 4·9	3 41 40·9	4 51 24
P.M.	β Tauri	26 30·5	27 2	9 27 33·5	28 4·5	28 35·5	9 27 33·2	3 42 49·38	5 44 43·82
—	δ Orionis	34 24	34 51·5	9 35 19	35 46	36 13·5	9 35 18·8	3 42 50·1	5 52 28·7
—	ε "	38 39	39 7	9 39 34·5	40 1·5	40 28·5	9 39 34·1	3 42 50·48	5 56 43·62
—	ζ "	43 14	43 41·5	9 44 9·5	44 36·5	45 3·5	9 44 9	3 42 50·89	6 1 18·11
—	β Aurigæ	57 42	58 21	9 58 59·5	59 38	60 16·5	9 58 59·4	3 42 52·24	6 16 7·16
—	γ Geminorum	38 45	39 14·5	10 39 43	40 11	40 40	10 39 42·7	3 42 55·82	6 56 46·88
—	ε "	.....	.....	10 45 17	45 47	46 17	10 45 16·95	3 42 56·32	7 2 20·63
—	Castor	34 19·5	34 53	11 35 25·5	35 57·5	36 30	11 35 25·1	3 43 0·78	7 52 24·32
—	Procyon	41 8	41 36·5	11 42 4	42 31	42 58·5	11 42 3·6	3 43 1·38	7 59 2·22
—	Pollux	45 30·5	46 2	11 46 33·5	47 4	47 35·5	11 46 33·1	3 43 1·78	8 3 31·32
2	δ Scorpii	59 38	0 8	8 0 38	1 7	1 37	8 0 37·6	3 43 45·62	4 16 51·98
A.M.	β "	4 54·5	5 24	8 5 53	clouded	6 51	8 5 52·83	3 43 46·09	4 22 6·74
—	Antares	28 13	28 44·5	8 29 15	29 45	30 15·5	8 29 14·6	3 43 48·08	4 45 26·52
P.M.	β Tauri	22 40·5	23 12·5	9 23 44	24 14·5	24 46	9 23 43·5	3 44 56·47	5 38 47·03

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
March 2	δ Orionis	30 33·5	31 1·5	9 31 28·7	31 56	32 23	9 31 28·54	3 44 57·17	5 46 31·37
P.M.	ε „	34 48·5	35 16·5	9 35 44	36 11	36 38	9 35 43·6	3 44 57·55	5 50 46·05
—	ζ „	39 23·5	39 51·2	9 40 18·5	40 46	41 13·5	9 40 18·54	3 44 57·97	5 55 20·57
—	☽'s 1st Limb .	.....	.....	9 42 13	42 42·5	43 12	9 42 —	3 44 58·14	.....
—	β Aurigæ	53 50·5	54 29·5	9 55 8·5	55 47	56 25·5	9 55 8·2	3 44 59·29	6 10 8·91
—	γ Geminorum .	34 54·5	35 24	10 35 52·5	36 20·5	36 49·5	10 35 52·2	3 45 2·96	6 50 49·24
—	ε „ .	.....	40 55·8	10 41 26	41 56	41 26·5	10 41 25·93	3 45 3·58	6 56 22·35
—	Procyon	37 18	37 46	11 38 13·5	38 40·5	39 8	11 38 13·2	3 45 8·43	7 53 4·77
—	Pollux	41 39·5	42 11	11 42 43	43 13	43 44·5	11 42 42·2	3 45 8·83	7 57 33·37
3	δ Scorpii.....	Clouded	sky.	7 — —	57 16·5	57 46·5	7 56 46·82	3 45 52·89	4 10 53·93
A.M.	α „	1 3·5	.....	8 2 2·8	2 31·5	3 1	8 2 2·43	3 45 53 38	4 16 9·05
—	Antares	24 23	.....	8 — —	25 55	26 26	8 25 24·5	3 45 55·41	4 39 29·09
P.M.	β Tauri	18 50·5	19 22	9 19 53·5	20 24	20 55·5	9 19 53·1	3 47 3·98	5 32 49·12
—	δ Orionis	26 44	27 11·5	9 27 39	28 4	28 33	9 27 38·3	3 47 4·67	5 40 33·63
—	ε „	30 59	31 27	9 31 54·5	32 21	32 48·5	9 31 54	3 47 5·06	5 44 48·94
—	ζ „	35 34·5	36 2	9 36 29·5	36 56·5	37 23·5	9 36 29·2	3 47 5.49	5 49 23·71
—	β Aurigæ	50 1	50 40·5	9 51 19·5	51 57·5	52 36·5	9 51 19	3 47 6·83	6 4 12·17
—	γ Geminorum .	31 5	31 34·5	10 32 3	32 31	33 0	10 32 2·7	3 47 10·46	6 44 52·24
—	☽'s 1st Limb .	34 36·8	35 7	10 35 36·5	36 6	36 35·6	10 35 36·38	3 47 10·78	6 48 25·6
—	ε Geminorum..	.....	.....	10 37 37	38 7	38 37	10 37 37·07	3 47 10·96	6 50 26·11
—	Castor	26 39	27 12·5	11 27 45	28 17	28 49·5	11 27 45·6	3 47 15·38	7 40 30·22
—	Procyon	33 28·5	33 57	11 34 23·5	34 51	35 18·5	11 34 23·7	3 47 15·98	7 47 7·72
—	Pollux	37 49·5	38 22	11 38 53	39 23·5	39 55	11 38 52·6	3 47 16·58	7 51 36·02
4 A.M.	Antares.....	20 33·5	21 5	8 21 35·5	22 6	22 36·5	8 21 35·3	3 48 3·9	4 33 31·4
P.M.	β Tauri	15 1	15 32·5	9 16 4	16 35	17 6	9 16 3·7	3 49 11·77	5 26 51·93
—	δ Orionis	.....	23 22·5	9 23 49·5	24 16·5	24 44	9 23 49·5	3 49 12·47	5 34 37·03
—	ε „	27 9·5	27 37·8	9 28 5·5	28 32	28 59·5	9 28 4·86	3 49 12·85	5 38 52·01
—	ζ „	.....	32 12·5	9 32 4	33 7	33 34·5	9 32 39·83	3 49 13·26	5 43 26·57
—	β Aurigæ	46 11·5	46 51	9 47 29·5	48 8	48 46·5	9 47 29·3	3 49 14·64	5 58 14·66
—	γ Geminorum .	27 15·5	27 44·5	10 28 13·5	28 41·5	29 10	10 28 13	3 49 18·23	6 38 54·77

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—	ε „ .	32 45·5	33 16·5	10 33 47	34 17	34 47·5	10 33 46·7	3 49 18·79	6 44 27·91
—	Castor	22 50	23 23	11 — —	24 27·5	25 0	11 23 55·12	3 49 23·34	7 34 31·78
—	☽'s 1st Limb .	26 30	27 0	11 27 29·5	27 59	28 28·5	11 27 29·4	3 49 23·66	7 38 5·74
—	* near ☽	.....	.....	11 29 49·5	.....	.....	11 29 49·5	3 49 24·03	7 40 25·47
—	Procyon	.....	.....	11 — —	.....	31 29	11 30 34·16	3 49 24·1	7 41 10·08
—	Pollux	34 0·5	34 32	11 35 3·5	35 34·5	36 5·5	11 35 3·2	3 49 24·34	7 45 38·86
5	δ Scorpii	48 8·5	48 39	7 49 9	49 38	50 7·5	7 49 8·4	3 50 8·49	3 58 59·91
A.M.	β „	53 25·5	53 55	7 54 24	54 53	55 22	7 54 23·9	3 50 8·98	4 4 14·92
—	Antares	16 44·5	17 15·5	8 17 46	18 16·2	18 47	8 17 45·84	3 50 11·91	4 27 33·93
P.M.	β Tauri	11 11·5	11 43·5	9 12 15	12 45·5	13 17	9 12 14·5	3 51 20·07	5 20 54·43
—	δ Orionis	19 4·5	19 32·5	9 29 0·2	20 27·5	20 55	9 19 59·94	3 51 20·85	5 28 59·09
—	ε „	23 20·5	23 48·5	9 24 16	24 43	25 10·5	9 24 15·7	3 51 21·23	5 32 54·47
—	ζ „	27 55	28 23	9 28 50·5	29 17·5	29 45·5	9 28 50·3	3 51 21·64	5 37 28·66
—	β Aurigæ	42 22·5	43 1·7	9 43 41	44 19	44 57·5	9 43 40·34	3 51 22·98	5 52 17·36
6	δ Scorpii	44 19·6	44 50	7 45 19·5	45 49	46 18·5	7 45 19·32	3 52 16·86	3 53 2·46
A.M.	β „	49 36	50 6	7 50 35	51 3·5	51 33	7 50 34·7	3 52 17·3	3 58 17·4
—	Antares	12 55	13 26·5	8 13 57·5	14 27·5	14 58	8 13 56·9	3 52 19·43	4 21 37·47
P.M.	β Tauri	.....	7 54	9 8 25·5	8 56	9 27·5	9 8 25·17	3 53 28·22	5 14 56·95
—	δ Orionis	15 15·5	15 43·5	9 16 11	16 37·5	17 5	9 16 10·5	3 53 28·92	5 22 41·58
—	ε „	19 30·5	19 58·5	9 20 26	20 58	21 21	9 20 25·8	3 53 29·23	5 26 56·57
—	ζ „	24 6	24 33·8	9 25 1·5	25 28·5	25 56	9 25 1·16	3 53 29·69	5 31 31·47
—	β Aurigæ	.....	39 12·5	9 39 51·5	40 29·5	41 8·5	9 39 51·17	3 53 31·02	5 46 20·15
—	Pollux	26 22	26 53·5	11 27 25	27 55·5	28 27	11 27 24·6	3 53 40·71	7 33 43·89
7	δ Scorpii	40 30·5	41 1	7 41 30·5	42 0	42 29·5	7 41 30·3	3 54 24·84	3 47 5·46
A.M.	β „	45 46·5	46 16·5	7 46 45·5	47 14	47 43	7 46 45·1	3 54 25·31	3 52 19·79
—	Antares	9 5·5	9 37	8 10 7·5	10 37·5	11 8·5	8 10 7·2	3 54 27·39	4 15 39·81
P.M.	β Tauri	Clouded	4 4·5	9 4 35·5	5 6·5	5 37·8	9 4 35·5	3 55 55·95	5 8 59·55
—	δ Orionis	.....	.....	9 — —	.....	13 15·5	9 12 20·81	3 55 36·65	5 16 44·16
—	ε „	.....	.....	9 16 36·5	17 3·5	17 31	9 16 36·47	3 55 37·08	5 20 59·39
—	ζ „	20 16	20 44	9 21 12	21 38·5	22 6	9 21 11·3	3 55 37·51	5 25 33·79
8	δ Scorpii	36 40·5	37 10·5	7 37 40·5	38 10	38 39·5	7 37 40·2	3 56 32·5	3 41 7·7
A.M.	β „	41 57	42 26·5	7 42 56	43 24·5	43 53·5	7 42 55·5	3 56 32·9	3 46 22·6

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
March 8	Antares	5 16	5 47·5	8 6 18	6 48	7 19	8 6 17·7	3 56 34·98	4 9 42·72
P.M.	β Tauri	59 43	0 15	9 0 46·5	1 17	1 48·4	9 0 45·98	3 57 43·52	5 3 2·46
—	δ Orionis	7 36	8 4	9 8 31·5	8 58·5	9 26	9 8 31·2	3 57 44·22	5 10 46·98
—	ε „	11 51	12 19	9 12 46·5	13 14	13 41	9 12 46·3	3 57 44·61	5 15 1·69
—	ζ „	16 26	16 54	9 17 21·5	17 48·5	18 16	9 17 21·2	3 57 45·02	5 19 36·18
—	β Aurigæ	30 54	31 33	9 32 12	32 50·5	33 29	9 32 11·7	3 57 46·35	5 34 25·35
—	Castor	7 32	8 5·5	11 8 38	9 10	9 42·5	11 8 37·6	3 57 54·93	7 10 42·67
—	Procyon	14 21	14 49	11 — —	.....	.....	11 15 16·75	3 57 55·53	7 17 21·22
—	Pollux	18 42·5	19 14·5	11 19 46	20 16·5	20 48	11 19 45·5	3 57 55·94	7 21 49·56
9	δ Scorpii	.....	.....	7 33 51	34 20·5	34 50·5	7 33 51·33	3 58 39·92	3 35 11·41
A.M.	β „	38 7·5	.....	7 39 6·5	.....	40 5·2	7 39 6·4	3 58 40·39	3 40 26·01
—	Antares	1 26·5	1 58	8 2 28·5	2 58·5	3 29·2	8 2 28·14	3 58 42·44	4 3 45·7
P.M.	β Tauri	55 53·5	56 25·2	8 56 56·5	57 27·5	57 58·5	8 56 56·24	3 59 50·82	4 57 5·42
—	δ Orionis	3 46·5	4 14·5	9 4 42	5 8·6	5 36·5	9 4 41·62	3 59 51·49	5 4 50·13
—	ε „	8 1·5	8 29·5	9 8 57	9 24	9 51·5	9 8 56·7	3 59 51·88	5 9 4·82
10	δ Scorpii	29 1·5	29 31·5	7 30 1·5	30 30·5	31 0	7 30 1	4 0 47·24	3 29 13·76
A.M.	β „	34 17·5	34 47·5	7 35 16·5	35 45	36 14	7 35 16·1	4 0 47·68	3 34 28·42
—	Antares	57 37	58 8	7 58 39	59 9	59 39·5	7 58 38·5	4 0 49·79	3 57 48·71
		Commencement of		Experiments	with Convertible Pendulums.				
17	γ Geminorum .	37 30·5	38 0	9 38 28·8	38 57	39 25·5	9 38 28·36	4 18 8·56	5 20 19·8
P.M.	ε „ .	43 1	43 32	9 44 2·5	44 32·5	45 3	9 44 2·2	4 18 8·61	5 25 53·59
—	δ „ .	19 27	19 57	10 20 26·5	20 56	21 25·5	10 20 26·4	4 18 8·91	6 2 17·49
—	Castor	33 5	33 38	10 34 10·5	34 43	.....	10 34 10·5	4 18 8·97	6 16 1·53
—	Procyon	39 54	40 22	10 40 49·5	41 17	41 44·5	10 40 49·4	4 18 9·1	6 22 40·3
—	Pollux	44 15·5	44 47·5	10 45 19	45 49·5	46 21	10 45 18·5	4 18 9·14	6 27 9·36
18	ζ Herculis	.....	43 19	7 43 51·5	44 23·5	44 55·8	7 43 51·33	4 18 12·85	3 25 38·48
A.M.	α „	.....	15 19	8 15 47·5	16 15·5	16 44	8 15 47·33	4 18 13·1	3 57 34·23
—	α Ophiuchi....	34 56	35 24·5	8 35 52·8	36 20·5	36 49	8 35 52·56	4 18 13·26	4 17 39·3
—	α Lyræ.....	.....	.....	9 — —	40 24·5	40 59·5	9 39 49·61	4 18 13·71	5 21 35·9
P.M.	γ Geminorum .	33 41	34 10·5	9 34 39	35 7	35 36	9 34 38·7	4 18 18	5 16 20·7

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APPENDIX. TABLE II.—Ascension Island.

—	ε " .	39 11·5	39 42·5	9 40 12·8	40 43	41 13·5	9 40 12·66	4 18 18	5 21 54·66
—	δ " .	15 37	16 8	10 16 37	17 6·5	17 36	10 16 36·9	4 18 18·27	5 58 18·63
—	Castor	29 15·5	29 48·5	10 30 21	30 53	31 25·5	10 30 20·7	4 18 18·38	6 12 2·32
—	Procyon	36 4	36 32	10 37 0	37 27	37 55	10 36 59·6	4 18 18·43	6 18 41·17
—	Pollux	40 26	40 58	10 41 29·2	42 0	42 31·5	10 41 28·94	4 18 18·47	6 23 10·47
19	α Herculis	11 0·5	11 29·5	8 11 58	12 26	12 54·5	8 11 57·7	4 18 22·33	3 53 35·37
A.M.	α Ophiuchi ...	31 6·5	31 35	8 32 3·5	32 31	32 59	8 32 3	4 18 22·46	4 13 40·54
—	α Lyræ.....	34 50	35 26	9 36 1	36 35	37 10·5	9 36 0·5	4 18 22·87	5 17 37·63
P.M.	γ Geminorum .	29 51·5	30 20·5	9 30 49	31 17·5	31 46	9 30 48·9	4 18 27·18	5 12 21·72
—	ε " .	35 21·5	35 52·5	9 36 22·5	36 52·5	37 23·2	9 36 22·44	4 18 27·22	5 17 55·22
—	δ " .	11 47	12 17	10 12 46·5	13 16·5	13 46	10 12 46·6	4 18 27·48	5 54 19·12
—	Castor	25 25	25 58·5	10 26 31	27 3	27 35·5	10 26 30·6	4 18 27·57	6 8 3·03
—	Procyon	32 14·5	32 42·5	10 33 1	33 37·5	34 5	10 33 9·9	4 18 27·62	6 14 42·28
—	Pollux	36 36	37 7·5	10 37 39	38 10	38 41·5	10 37 38·8	4 18 27·65	6 19 11·15
20	α Herculis	7 10·5	7 39·5	8 8 8	8 36	9 4·5	8 8 7·7	4 18 31·43	3 49 36·27
A M.	α Ophiuchi ...	27 17	27 45	8 28 13	28 41·5	29 9	8 28 13·1	4 18 31·56	4 9 41·54
—	α Lyræ.....	30 59·5	31 35·5	9 32 10·5	32 45·5	33 20·5	9 32 10·3	4 18 31·99	5 13 38·31
P.M.	γ Geminorum .	26 1	26 30·8	9 26 59	27 27·5	27 56	9 26 58·86	4 18 36·38	5 8 22·48
—	ε " .	.....	32 2·5	9 32 33	33 3	33 33·5	9 32 32·83	4 18 36·52	5 13 56·31
—	δ " .	7 57	8 27·5	10 8 57	9 26	9 56·2	10 8 56·74	4 18 36·68	5 50 20·06
—	Castor	21 35·5	22 8·5	10 22 41	23 13	23 45·5	10 22 40·7	4 18 36·81	6 4 3·89
—	Procyon	28 24	28 52·5	10 29 20	29 47·5	30 15	10 29 19·8	4 18 36·86	6 10 42·94
—	Pollux	32 46·2	33 18	10 33 49	34 20	34 51·5	10 33 48·94	4 18 36·89	6 15 12·05
21	α Herculis	.....	3 49·5	8 4 18	4 46	5 14·5	8 4 17·83	4 18 40·55	3 45 37·28
A.M.	α Ophiuchi....	23 26·5	23 55·2	8 24 23·5	24 51·5	25 19·5	8 24 23·24	4 18 40·71	4 5 42·53
—	α Lyræ.....	27 9·5	27 45·5	9 28 20·5	28. 55·5	29 30·5	9 28 20·3	4 18 41·22	5 9 39·08
P.M.	γ Geminorum .	22 11	22 40	9 23 8·5	23 36·5	23 6	9 23 8·4	4 18 45·34	5 4 23·06
—	ε " .	27 41	28 12	9 28 42·5	29 12·5	29 43	9 28 42·2	4 18 45·38	5 9 56·82
—	δ " .	4 7	4 37	10 5 6·5	5 36	6 6	10 5 6·5	4 18 45·65	5 46 20·85
—	Castor	17 45·5	18 18·5	10 18 50·5	19 23	19 55	10 18 50·5	4 18 45·74	6 0 4·76
—	Procyon	24 34	25 2	10 25 30	25 57	26 25	10 25 29·6	4 18 45·79	6 6 43·81
—	Pollux	28 55·5	29 27·5	10 29 59	30 30	31 1	10 29 58·6	4 18 45·82	6 11 12·78

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
March 22	α Herculis	59 30·5	59 59	8 0 28	0 56	1 24·5	8 0 27·6	4 18 49·43	3 41 38·17
A.M.	α Ophiuchi....	19 36·5	20 5	8 20 33·5	21 1	21 29	8 20 33	4 18 49·57	4 1 43·43
P.M.	γ Geminorum .	.....	18 50	9 19 18·5	19 47	20 15·5	9 19 18·5	4 18 53·9	5 0 24·6
—	ε „ .	23 51·5	24 22	9 24 52·5	25 22·5	25 53	9 24 52·3	4 18 53·94	5 5 58·36
—	δ „ .	0 16·5	0 47	10 1 16·5	1 45·5	2 15·5	10 1 16·2	4 18 54·19	5 42 22·01
—	Castor	13 55	14 28	10 15 0·5	25 32·5	16 5	10 15 0·2	4 18 54·29	5 56 5·91
—	Procyon	.....	21 12	10 21 39·5	22 7	22 34·5	10 21 39·5	4 18 54·33	6 2 45·17
—	Pollux	25 6·5	25 37·5	10 26 8·5	26 39·5	27 11	10 26 8·6	4 18 54·36	6 7 14·24
23	α Herculis	55 40	56 9	7 56 37·5	57 5·5	57 34	7 56 37·2	4 18 57·95	3 37 39·25
A.M.	α Ophiuchi....	15 46·5	16 14·5	8 16 43·5	17 11	17 39	8 16 42·9	4 18 58·06	3 57 44·84
—	α Lyræ.....	19 29	20 4·5	9 20 39·5	21 14·5	21 49·5	9 20 39·4	4 18 58·41	5 1 40·99
P.M.	γ Geminorum .	14 30·5	14 59·5	9 15 28	15 56·5	16 25	9 15 27·9	4 19 2·12	4 56 25·78
—	ε „ .	20 0·5	20 31·5	9 21 2	21 32	22 2·5	9 21 1·7	4 19 2·16	5 1 59·54
—	δ „ .	56 26·5	56 56·5	9 57 26	57 55·5	58 26	9 57 26·1	4 19 2·33	5 38 23·77
—	Castor	10 4·5	10 38	10 11 10	11 44·5	12 14·5	10 11 10·3	4 19 2·41	5 52 7·89
—	Procyon.....	16 53·5	17 21·5	10 17 49	18 16·5	18 44	10 17 48·9	4 19 2 45	5 58 46·45
—	Pollux	21 15	.....	10 22 18·5	.....	.....	10 22 18·5	4 19 2·48	6 3 16·02
24	α Herculis	51 49·5	52 18·5	7 52 47	53 15	53 43·5	7 52 46·7	4 19 6·08	3 33 40·62
A.M.	α Ophiuchi....	11 56	12 24·5	8 12 52·5	13 20	13 48·5	8 12 52·3	4 19 6·23	3 53 46·07
—	α Lyræ.....	15 38·5	16 14·5	9 16 49	17 24	17 59·5	9 16 49·1	4 19 6·67	4 57 42·43
P.M.	γ Geminorum .	.....	.....	9 — —	12 6·5	12 35	9 11 38·12	4 19 10·71	4 52 27·41
—	δ „ .	.....	53 7	9 53 36	54 6	54 35·2	9 53 36·33	4 19 10·97	5 34 25·36
—	ε „ .	16 11	16 41·5	9 17 12	17 42	18 12·5	9 17 11·8	4 19 10·72	4 58 1·08
—	Castor	6 15	6 48	10 7 20	7 52·5	.....	10 7 20·17	4 19 11·07	5 48 9·1
25	α Herculis	48 0	48 28·5	7 48 57	49 25·5	49 53·5	7 48 56·9	4 19 14·76	3 29 42·14
A.M.	α Ophiuchi....	8 6	8 34·5	8 9 2·5	9 30·5	9 58	8 9 2·3	4 19 14·9	3 49 47·4
—	α Lyræ.....	11 48·5	12 24·5	9 12 59·5	13 34·5	14 9·5	9 12 59·3	4 19 15·31	4 53 43·99
P.M.	γ Geminorum .	.....	.....	9 — —	8 16·5	8 45	9 7 48·12	4 19 19·55	4 48 28·57
—	ε „ .	12 20·5	12 51·5	9 13 22	13 52	14 22	9 13 21·6	4 19 19·6	4 54 2
—	δ „ .	.....	.....	9 — —	50 15·5	50 45·5	9 49 46·26	4 19 19·8	5 30 26·46

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—	Castor	2 24·5	2 57·5	10 3 30	4 2·5	4 35	10 3 29·9	4 19 19·9	5 44 10
—	Procyon	9 13·5	9 41·5	10 10 9	10 37	11 4	10 10 9	4 19 19·94	5 50 49·06
—	Pollux	13 35	14 7·5	10 14 38·5	15 9·5	15 40·5	10 14 38·2	4 19 19·97	5 55 18·23
26	α Herculis	.....	44 39	7 45 6·5	45 35	46 3·5	7 45 6·83	4 19 23·72	3 25 43·11
A.M.	α Ophiuchi....	4 15·5	4 44·5	8 5 12·5	5 40·5	6 8·5	8 5 12·3	4 19 23·86	3 45 48·44
—	α Lyræ.....	7 58·5	8 34	9 9 9·2	9 44	10 19·5	9 9 9·04	4 19 24·29	4 49 44·75
P.M.	γ Geminorum .	3 0	3 29	9 3 58	4 26	4 55	9 3 57·6	4 19 28·42	4 44 29·18
—	ε „ .	8 30	9 1	9 9 31·5	10 1·5	10 32	9 9 31·2	4 19 28·46	4 50 2·74
—	δ „ .	44 56	45 26	9 45 56	46 25	46 54·5	9 45 55·5	4 19 28·71	5 26 26·79
—	●	.....	53 34	9 54 6·5	54 38	55 11	9 54 6·17	4 19 28·76	5 34 37·41
—	Castor	58 34	59 7·5	9 59 39·5	0 12	0 44·5	9 59 39·5	4 19 28·8	5 40 10·7
—	Procyon	5 23	5 51	10 6 18·5	6 46	7 14	10 6 18·5	4 19 28·83	5 46 49·67
—	Pollux	9 44·5	10 17	10 10 47·5	11 19	11 50·5	10 10 47·7	4 19 28·86	5 51 18·84
27	α Ophiuchi....	0 25·5	0 54·5	8 1 22·5	1 50·5	2 18·5	8 1 22·3	4 19 32·43	3 41 49·87
A.M.	γ Draconis....	25 24·5	26 9·8	8 — —	27 37·5	28 22	8 26 53·45	4 19 32·75	4 7 20·7
—	α Lyræ.....	4 8·5	4 44	9 5 19	5 54	6 29·5	9 5 19	4 19 32·98	4 45 46·02
P.M.	γ Geminorum .	.....	.....	9 — —	0 36	.....	9 0 7·8	4 19 36·93	4 40 30·87
—	ε „ .	4 40·5	5 11	9 5 41	6 11·5	6 41·5	9 5 41·1	4 19 36·97	4 46 4·13
—	δ „ .	.....	.....	9 42 6	42 35	43 4·5	9 42 5·67	4 19 37·25	5 22 28·42
—	Pollux	5 54·5	6 27	10 6 58	7 29	8 0	10 6 57·7	4 19 37·42	5 47 20·28
28	α Herculis	36 29·5	36 58·5	7 37 26·5	37 55	38 23·5	7 37 26·6	4 19 40·97	3 17 45·63
A.M.	α Ophiuchi....	56 35·5	57 4	7 57 32	58 0	58 28·5	7 57 32	4 19 41·07	3 37 50·93
—	α Lyræ.....	0 18	0 54	9 1 29	2 ·4	2 39	9 1 28·8	4 19 41·27	4 41 47·53
29	α Herculis	32 39·5	33 8·5	7 33 37	34 5	34 33·5	7 33 36·7	4 19 50·3	3 13 46·4
A.M.	α Ophiuchi ...	52 46	53 14·5	7 53 43	54 10·5	54 38·5	7 53 42·5	4 19 50·42	3 33 52·08
—	α Lyræ.....	56 29	57 4·5	8 57 39·5	58 14·5	58 49·5	8 57 39·4	4 19 50·8	4 37 48·6
P.M.	γ Geminorum .	.....	.....	8 52 28	52 26·5	53 25	8 52 27·75	4 19 55·3	4 32 32·45
30	α Herculis	28 50·5	29 19·5	7 29 48	30 16	30 44·5	7 29 47·7	4 19 59·86	3 9 47·84
A.M.	α Ophiuchi....	48 56·5	49 25	7 49 53·5	50 21	50 49	7 49 53	4 19 59·99	3 29 53·01
—	γ Draconis....	13 56	14 41	8 15 25	16 9	16 53·5	8 15 24·9	4 20 0·15	3 55 24·75
—	α Lyræ.....	52 39·5	53 15	8 53 50	54 25	55 0·5	8 53 50	4 20 0·39	4 33 49·61
P.M.	☽'s 1st Limb .	32 11·5	32 41·5	8 33 11	33 40·5	34 10	8 33 10·9	4 20 4·4	4 13 6·5

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
March 30	γ Geminorum .	47 40·5	48 9·5	8 48 38·4	49 6·5	49 35·5	8 48 38·08	4 20 4·5	4 28 33·58
P.M.	ε ,, .	53 10·5	53 41·5	8 — —	54 42·5	55 12·5	8 54 11·75	4 20 4·53	4 34 7·22
31	☽'s 1st Limb .	25 33	26 3	9 26 33	27 2·5	27 31·5	9 26 32·6		
P.M.	*k* Geminorum .	39 43·5	40 12·5	9 40 41	41 9·5	41 38	9 40 10·9		
—	Procyon	46 14	46 42	9 47 9·5	47 37	48 4·5	9 47 9·4		
—	1 Cancri.....	3 5	3 34·5	10 4 3·5	4 31·5	5 0	10 4 2·9		
April 1	*k* Geminorum .	35 53·5	36 22·5	9 36 51	37 19·5	37 48	9 36 50·9		
P.M.	1 Cancri.....	59 15·5	59 44·5	10 0 13	0 41·5	1 10	10 0 12·9		
—	*r* Cancri.....	3 43	4 12·5	10 4 41	5 9·2	5 38	10 4 40·74		
—	☽'s 1st Limb .	16 36·5	17 6	10 17 35·7	18 4·4	18 33·5	10 17 35·22		
—	Regulus.....	10 55	11 23·5	12 11 51	12 19·5	12 47·5	12 11 51·3		
				At the Green	Mountain.				
9	⊙'s 1st Limb	51 58	52 25·5	2 52 53·5	53 21·5	53 49·5	2 53 58·15	3 14 47·49	11 39 10·66
	⊙'s 2d Limb	54 7·5	54 34·8	2 55 2·5	55 30·2	55 58·5			
P.M.	Castor	.....	.....	9 — —	.....	7 18	9 6 12·25	3 15 21·89	5 50 50·36
—	Pollux	16 16·5	16 47·5	9 17 18·5	.....	.....	9 17 18·33	3 15 23·13	6 1 55·2
	After these observations were therefore this day's		made, the observations	Transit Instrument was brought more cannot be made use of for rating the Clock.			nearly into the	direction of the	meridian, and
10	⊙'s 1st Limb	51 46	52 14	2 52 41	53 9·2	53 37·5	2 53 46·02	3 17 1·06	11 36 44·96
	⊙'s 2d Limb	.....	54 23	2 54 50	55 18	55 46·5			
12	⊙'s 1st Limb	51 25·5	51 54	2 52 21·5	52 49	53 18	2 53 26·3	3 21 27·76	11 31 58·54
	⊙'s 2d Limb	53 35·5	54 3	2 54 31	54 58·5	55 27			
13	⊙'s 2d Limb..	.....	.....	2 — —	54 48·5	55 16·5			
	⊙'s Centre ...	.....	.....	.....	.....	.....	2 53 15·69	3 23 40·6	11 29 35·09
14	⊙'s 1st Limb	.....	.....	2 52 1·5	.....	52 58	2 53 6·5	3 25 53·33	11 27 13·17
	⊙'s 2d Limb	.....	.....	2 54 11·5	.....	55 7			

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Fernando de Noronha.

June 21	ζ Ursæ Maj. ..	29 16·5	30 5·5	11 30 54	31 43	32 33	11 30 54·4	4 14 13·02	7 16 41·38
P.M.	g „ ..	.....	31 26	11 32 14	33 3	33 53	11 32 14·33	4 14 13·13	7 18 1·2
—	ζ Virginis.....	39 0	39 27·5	11 39 54·5	40·22	40 50	11 39 54·8	4 14 13·73	7 25 41·07
—	τ Bootis.....	52 3	52 32	11 53 0·5	53 29·4	.....	11 53 0·62	4 14 14·75	7 38 45·87
—	η Ursæ Maj. ..	.....	.....	11 54 36·5	55 20·4	56 4·5	11 54 37·24	4 14 14·87	7 40 22·37
—	η Bootis.....	59 26	59 55	12 0 23·7	0 53	.....	12 0 23·9	4 14 15·31	7 46 8·59
—	α Draconis....	.....	.....	12 13 30·5	14 36·4	.....	12 13 30·71	4 14 16·33	7 59 14·38
—	γ Bootis.....	37 45	38 20·5	12 38 55·2	39 31	40 7	12 38 55·74	4 14 18·29	8 24 37·45
—	c „	.....	12 57·6	1 13 27·2	13 57·5	14 28·5	1 13 27·3	4 14 20·93	8 59 6·37
—	δ „	.....	21 41·5	1 22 14·2	22 47·5	23 21·5	1 22 14·42	4 14 21·6	9 7 52·82
—	μ „ ...	.....	31 3·5	1 31 37·8	32 12·5	32 48·5	1 31 37·95	4 14 22·33	9 17 15·62
—	α Cor. Bor. ...	40 1	40 32	1 41 2·5	41 33·2	42 5	1 41 2·74	4 14 23 15	9 26 39·59
—	α Serpentis ...	.....	.....	1 49 26·5	49 54	50 22·5	1 49 26·44	4 14 23·8	9 35 2·64
22	⊙'s 1st Limb	11 33	12 3	4 12 32·5	13 2·7	13 33	4 13 41·69	4 15 28·76	11 58 12·93
	⊙'s 2d Limb	13 50·5	14 21	4 14 50	15 20·2	15 51			
P.M.	τ Bootis.....	48 13·5	48 42	11 49 11	49 40	.....	11 49 11·02	4 16 2·97	7 33 8·05
—	η „ ...	.....	.....	11 56 34·5	57 3·5	57 33·5	11 56 34·54	4 16 3·53	7 40 31·01
—	Arcturus.....	16 52·5	17 21·7	12 17 50·5	18 19·8	18 49·5	12 17 50·8	4 16 5·12	8 1 45·68
—	γ Bootis.....	.....	.....	12 — —	35 41·5	36 17·5	12 35 6·02	4 16 6·53	8 18 59·49
—	ε „	46 23	46 54	12 47 24·5	47 55·7	48 27·5	12 47 24·94	4 16 7·46	8 31 17·48
—	β Ursæ Min. ..	.....	.....	1 1 1·5	2 46·8	.....	1 1 1·59	4 16 8·47	8 44 53·12
—	β Bootis.....	.....	4 44·5	1 5 20	5 57	6 34	1 5 20·45	4 16 8·79	8 49 11·66
—	c „	8 37	9 7·5	1 9 37·5	10 8	10 39	1 9 37·8	4 16 9·11	8 53 28·69
—	δ „	17 18·5	17 52	1 18 24·5	18 58	19 31·7	1 18 24·94	4 16 9·79	9 2 15·15
23	⊙'s 1st Limb	11 52·5	12 22·5	4 — —	13 22·5	13 52·8	4 14 1·18	4 17 17·37	11 56 43·81
	⊙'s 2d Limb	.....	14 40	4 11 8·6	15 39·5	16 10·5			
P.M.	ζ Ursæ Maj. ..	21 38·5	22 28	11 23 15·7	24 4·8	24 54·5	11 23 16·3	4 17 49·79	7 5 26·51
—	g „ ..	22 59	23 47·5	11 24 36	25 24·5	21 15	11 24 36·4	4 17 49·89	7 6 46·51
—	ζ Virginis	.....	31 49	11 32 15·5	32 43·5	33 11	11 32 15·82	4 17 50·27	7 14 25·55
—	τ Bootis.....	44 24·5	44 53·5	11 45 22	45 51	46 20·5	11 45 22·3	4 17 51·26	7 27 31·04

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Appendix. Table II.—Fernando de Noronha.

1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
June 23	η Bootis.....	51 47·5	52 16·5	11 52 45	53 14·2	53 44	11 52 45·44	4 17 51·82	7 34 58·62
P.M.	α Draconis....	3 42	4 47·5	12 5 52	6 57·5	8 4·5	12 5 52·7	4 17 52·82	7 47 59·88
—	Arcturus	13 3	13 32	12 14 1	14 30	15 0	12 14 1·2	4 17 53·44	7 56 7·76
—	π Bootis.....	37 50	38 19	12 38 47	39 16	39 45·5	12 38 47·5	4 17 55·33	8 20 52·17
—	ε ,, ...	42 34	43 5·2	12 43 35·5	44 6·5	44 38	12 43 35·84	4 17 55·69	8 25 40·15
—	β Ursæ Min...	53 44·5	55 29·5	12 57·13	58 57·5	60 45·5	12 57 14	4 17 56·72	8 39 17·28
—	β Bootis.....	.....	.....	1 — —	2 7·5	2 44·5	1 1 30·92	4 17 57·05	8 43 33·87
—	c ,, ...	4 48	5 18·5	1 5 48·5	6 19	6 50	1 5 48·4	4 17 57·37	8 47 51·03
—	δ ,, ...	13 30·4	14 3·5	1 14 36	15 9·4	15 43	1 14 36·46	4 17 58·04	8 56 38·42
—	μ ,, ...	22 50	23 25·5	1 23 59·5	24 34·5	25 10	1 23 59·9	4 17 58·75	9 6 1·15
—	α Cor. Bor. ...	32 22·5	32 53·5	1 33 24	33 55	34 26·5	1 33 24·3	4 17 59·47	9 15 24·83
24	⊙'s 1st Limb	12 12	12 42	4 13 11·5	13 41·5	14 12	4 14 20·39	4 19 5·99	11 55 14·4
	⊙'s 2d Limb	14 29	14 59·2	4 15 28·5	15 58·7	16 29·5			
P.M.	ζ Ursæ Maj. ..	.....	18 38·5	11 19 26	20 15·5	21 5·5	11 19 26·65	4 19 37·94	6 59 48·71
—	g ,, ..	19 9·6	19 58·5	11 20 46·5	21 35·5	22 25·5	11 20 47·12	4 19 38·04	7 1 9·08
—	ζ Virginis.....	27 32	27 59·5	11 28 26·5	28 54	29 21·9	11 28 26·78	4 19 38·12	7 8 48·66
—	τ Bootis.....	40 35·5	41 4	11 41 32·5	42 1·5	42 31	11 41 32·9	4 19 39·62	7 21 53·28
—	η ,, ...	47 58	48 27·5	11 48 56	49 25	49 54·5	11 48 56·2	4 19 40·17	7 29 16·03
—	α Draconis....	.....	.....	12 2 3	3 9	4 16	12 2 3·37	4 19 41·17	7 42 22·2
—	Arcturus.....	9 14	9 43	12 10 12	10 41	11 11	12 10 12·2	4 19 41·78	7 50 30·42
—	γ Bootis.....	26 17·5	26 53	12 27 27·5	28 3	28 39	12 27 28	4 19 43·09	8 7 44·91
—	ε ,, ...	38 44·5	39 15·5	12 39 46·5	40 17·5	40 49	12 39 46·6	4 19 44·03	8 20 2·57
—	β Ursæ Min...	49 54·5	51 39	12 53 23	55 8·5	56 55·5	12 53 24·1	4 19 45·05	8 33 39·05
—	c Bootis.....	0 59	1 29	1 1 59·5	2 30	3 1	1 1 59·7	4 19 45·68	8 42 14·62
—	δ ,, ...	9 40·5	10 13·5	1 10 46·5	11 19·5	11 53·5	1 10 46·7	4 19 46·4	8 51 0·3
—	α Cor. Bor. ...	28 33	29 4	1 29 34	30 5·5	30 37	1 29 34·7	4 19 47·77	9 9 46·93
25	⊙'s 1st Limb	12 31	13 1	4 13 31	14 1	14 31·5	4 14 39·82	4 20 54·39	11 53 45·43
	⊙'s 2d Limb	14 48·5	15 18·5	4 15 48·5	16 18·2	16 49			
P.M.	ζ Ursæ Maj. ..	13 59·5	14 48·5	11 15 36·5	16 26	17 15·4	11 15 37·18	4 21 25·95	6 54 11·23
—	g ,, ..	15 19·5	16 8·5	11 16 57	17 45·8	18 36	11 16 57·36	4 21 26·05	6 55 31·31

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APPENDIX. TABLE II.—Fernando de Noronha.

—	α Draconis....	.....	57 8·5	11 58 13	59 18·5	.....	11 58 13·33	4 21 29·15	7 36 44·18
—	γ Bootis.....	.....	.....	12 23 38·5	24 13·8	24 50	12 23 38·46	4 21 31·06	8 2 7·4
—	ε „	.....	35 25·5	12 35 56·4	36 27·5	36 59	12 35 56·39	4 21 31·98	8 14 24·41
—	δ „	5 50	6 23·5	1 6 56	7 29	.....	1 6 56·11	4 21 34·32	8 45 21·79
—	μ „	15 10·5	15 45·5	1 16 19·5	16 54·5	17 30	1 16 20	4 21 35·02	8 54 44·98
—	α Cor. Bor....	24 42·5	25 13·5	1 25 44·4	26 15	26 46·5	1 25 44·38	4 21 35·73	9 4 8·65
—	α Serpentis....	33 13·5	33 41	1 34 8·2	34 36	35 4·5	1 34 8·64	4 21 36·44	9 12 32·2
26	⊙'s {1st Limb	12 50·2	13 20	4 13 49·6	14 20	14 50·5			
	{2d Limb	15 7·5	15 37·5	4 16 7	16 37	17 8	4 14 58·73	4 22 42·74	11 52 15·99
P.M.	ζ Virginis.....	19 52·5	20 20·2	11 20 47	21 14·5	21 42·5	11 20 47·34	4 23 14·74	6 57 32·6
—	τ Bootis.....	32 55·8	33 24·5	11 33 53·5	34 22·5	34 52	11 33 53·66	4 23 15·84	7 10 37·82
—	η „	40 19	40 48	11 41 16·5	41 46	42 15·2	11 41 16·94	4 23 16·30	7 18 0·64
—	α Draconis....	52 13·5	53 19·2	11 — —	.....	56 36·5	11 54 24·58	4 23 17·62	7 31 6·96
—	Arcturus.....	1 34·5	2 3·7	12 2 32·2	3 1·5	3 31·2	12 2 32·62	4 23 17·91	7 39 14·71
—	γ Bootis.....	.....	19 13·5	12 19 48	20 24	20 59·5	12 19 48·36	4 23 19·22	7 56 29·14
—	π „	26 21·5	26 50·5	12 27 18·5	27 47·5	28 17	12 27 19	4 23 19·79	8 3 59·21
—	ε „	.....	.....	12 32 7	32 38	33 10	12 32 7·04	4 23 20·15	8 8 46·89
—	ξ „	37 7·5	37 36·5	12 38 5·5	38 35	.....	12 38 5·65	4 23 20·61	8 14 45·04
—	β „	48 50	49 26·5	12 50 2·5	50 39	51 16	12 50 2·8	4 23 21·51	8 26 41·29
—	c „	53 19·5	53 50	12 54 20	.....	55 21·5	12 54 20·25	4 23 21·84	8 30 58·41
—	α Cor. Bor.	20 54	21 25	1 21 55·2	22 26	22 57·5	1 21 55·54	4 23 23·95	8 58 31·59
—	α Serpentis....	29 24	29 51·5	1 30 19	30 47	31 15	1 30 19·3	4 23 24·58	9 6 54·72
27	⊙'s {1st Limb	13 9	13 39	4 14 8	.....	15 10			
	{2d Limb	15 27	15 57	4 16 26·5	16 56·5	17 27	4 15 17·93	4 24 31·38	11 50 46·55
P.M.	ζ Virginis.....	.....	16 30·5	11 16 57·5	17 25	17 53	11 16 57·6	4 25 3·27	6 51 54·33
—	τ Bootis.....	29 6·5	29 35·2	11 30 3·5	30 32·5	31 2	11 30 3·94	4 25 4·17	7 4 59·77
—	η „	36 29·2	.....	11 37 27·5	37 56	38 26	11 37 27·4	4 25 4·73	7 12 22·67
—	α Draconis....	48 24·5	49 29·6	11 — —	.....	.....	11 50 34·47	4 25 5·74	7 25 28·73
—	Arcturus	57 45	58 14	11 58 43	59 12	59 42	11 58 43·2	4 25 6·28	7 33 36·92
—	γ Bootis.....	14 48·5	15 23·6	12 15 59	16 34·5	17 10·5	12 15 59·22	4 25 7·68	7 50 51·54
—	π „	22 32	23 1	12 — —	23 58·5	.....	12 23 29·58	4 25 8·25	7 58 21·33
—	ε „	27 15·5	27 47	12 28 17·5	28 48·5	29 20	12 28 17·7	4 25 8·62	8 3 9·08

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Appendix. Table II.—Fernando de Noronha.

1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
June 27	ξ Bootis.....	33 18	33 47	12 34 16	34 45	35 15	12 34 16·2	4 25 9·07	8 9 7·13
P.M.	β Ursæ Min...	38 26	40 11·8	12 41 55	43 40	45 27·5	12 41 56	4 25 9·66	8 16 46·34
—	c Bootis.....	.....	50 1	12 50 30·5	51 1·5	51 32·5	12 50 30·97	4 25 10·26	8 25 20·71
—	δ „	58 12	.....	12 59 18	59 51·2	.....	12 59 18	4 25 10·91	8 34 7·09
—	μ „	7 32·5	8 7·5	1 — —	.....	9 52	1 8 42·12	4 25 11·71	8 43 30·41
—	α Cor Bor. ...	.....	17 35·5	1 18 5·7	18 37	19 8·5	1 18 6·04	4 25 12·42	8 52 53·62
—	α Serpentis....	.....	26 2	1 26 29·5	26 57·2	27 25·5	1 26 29·55	4 25 13·06	9 1 16·49
28	⊙'s 2d Limb..	15 45·5	16 15·5	4 16 45	17 15	Centre =	4 15 36·68	4 26 20·34	11 49 16·34
P.M.	ζ Ursæ Maj. ..	2 31	3 20	11 4 8·5	4 57·4	5 47·3	11 4 8·84	4 26 50·12	6 37 18·72
—	g „ ..	3 51·2	4 40	11 5 28·5	6 17·5	7 7·7	11 5 28·98	4 26 50·24	6 38 38·74
—	ζ Virginis.....	12 13·8	12 41·4	11 13 8·2	13 35·9	14 4	11 13 8·66	4 26 51·8	6 46 16·86
—	η Bootis.....	32 40	33 9	11 33 37·5	34 6·5	34 36·5	11 33 37·9	4 26 53·35	7 6 44·55
—	α Draconis....	44 34·5	45 39·5	11 46 44	47 49·5	48 56·2	11 46 44·74	4 26 54·35	7 19 50·39
—	Arcturus	53 55·5	54 24	11 54 53	55 22·5	55 52·5	11 54 53·5	4 26 54·97	7 27 58·53
—	π Bootis.....	18 42·5	19 11	12 19 39·5	20 8·5	20 37·5	12 19 39·8	4 26 56·84	7 52 42·96
—	ε „	23 26	23 57	12 24 27·8	24 58·5	25 30·5	12 24 27·96	4 26 57·2	7 57 30·76
—	ξ „	29 28	29 57·5	12 30 26·2	30 55·5	31 25·5	12 30 26·54	4 26 57·66	8 3 28·88
—	δ „	54 22·5	54 55·5	12 55 28	56 1·5	56 35	12 55 28·5	4 26 59·58	8 28 28·92
—	μ „	3 42·5	4 17·5	1 4 52	5 26·6	6 2	1 4 52·12	4 27 0·3	8 37 51·82
—	α Serpentis....	.....	22 12·5	1 22 40	23 7·5	23 36	1 22 40	4 27 1·64	8 55 38·36
29	⊙'s 1st Limb	13 47	14 17	4 14 46·5	15 16·5	15 47·2	4 15 55·45	4 28 9·16	11 47 46·29
	⊙'s 2d Limb	16 4·2	16 34·2	4 — —	17 34	.....			
P.M.	Spica Virg.....	.....	.....	10 59 33·2	0 1	0 29·5	10 59 33·1	4 28 39·6	6 30 53·5
—	ζ Virginis.....	8 24	8 51·5	11 9 18·5	9 46	10 14·5	11 9 18·9	4 28 40·37	6 40 38·53
—	☽'s 1st Limb..	25 12·2	25 40·7	11 26 8·2	26 36·2	27 5	11 26 8·46	4 28 41·65	6 57 26·81
—	α Draconis....	.....	.....	11 — —	44 0	45 6·8	11 42 54·47	4 28 42·95	7 14 11·52
—	Arcturus.....	50 6	50 35	11 51 4	51 33	52 2·5	11 51 4·1	4 28 43·54	7 22 20·56
—	γ Bootis	7 9·7	7 45	12 8 20	8 55·5	9 31·4	12 8 20·32	4 28 44·89	7 39 35·43
—	π „	14 53	15 22	12 15 50	16 19	16 48	12 15 50·4	4 28 45·44	7 47 4·96
—	ε „	19 36·5	.....	12 — —	.....	.....	12 20 38·32	4 28 45·81	7 51 52·51

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APPENDIX. TABLE II.—Fernando de Noronha.

—	β Ursæ Min. ..	30 46·5	.....	12 34 15·5	.....	.....	12 34 15·37	4 28 46·84	8 5 28·53
—	*c* Bootis.....	41 50·5	42 21	12 42 51	43 21·5	43 52·5	12 42 51·3	4 28 47 77	8 14 3·53
—	μ "	59 52·5	.....	1 1 1·5	1 36·7	2 12	1 1 1·96	4 28 48 87	8 32 13·09
—	α Cor. Bor. ...	9 25	9 55·9	1 10 26	10 57	11 28·5	1 10 26·48	4 28 49·65	8 41 36·83
—	α Serpentis ...	.....	18 23	1 18 50·5	19 18	19 46·5	1 18 50·5	4 28 50·22	8 50 0·28
30	⊙'s {1st Limb	14 5·5	14 35·5	4 15 5	15 35	16 5·7			
	⊙'s {2d Limb	16 22·5	16 52·5	4 17 22	17 52	18 22·7	4 16 13·84	4 29 58·27	11 46 15·57
P.M.	Spica Virg.	.....	55 16·5	10 55 44	56 12	56 40·5	10 55 44·13	4 30 28·46	6 25 15·67
—	ζ Virginis	4 35	5 2·5	11 5 29·5	5 57	6 25	11 5 29·8	4 30 29·2	6 35 0·6
—	η Bootis	25 1	25 30	11 25 59	26 28	26 57·5	11 25 59·1	4 30 30·76	6 55 28·34
—	α Draconis....	.....	.....	11 39 5	40 10·8	41 17·4	11 39 4·94	4 30 31·75	7 8 33·19
—	Arcturus.....	46 16·5	.....	11 47 14·5	47 44	48 13·5	11 47 14·81	4 30 32·37	7 16 42·44
—	☽'s 1st Limb .	8 42·5	9 11	12 9 39·5	10 8	10 36·5	12 9 39·5	4 30 34·09	7 39 5·41
—	ε Bootis	.....	16 18·5	12 16 49	17 20	17 51·5	12 16 49·04	4 30 34·63	7 46 14·41
—	ξ "	21 49	22 18·5	12 22 47	23 16·5	23 46·5	12 22 47·5	4 30 35·09	7 52 12·41
—	β Ursæ Min. ..	26 55·5	28 40·5	12 30 24·2	32 9	33 56	12 30 25·04	4 30 35·68	7 59 49·36
—	*c* Bootis	38 1·2	38 31·5	12 39 1·8	39 32·5	40 3·5	12 39 2·1	4 30 36·34	8 8 25·76
—	δ "	46 43	47 16	12 47 48·5	48 22	48 56	12 47 49·1	4 30 37·01	8 17 12·09
—	μ "	56 3·5	56 38	12 57 12·5	57 47·5	58 23	12 57 12·9	4 30 37·74	8 26 35·16
—	α Cor. Bor....	5 36	6 6·5	1 6 37	7 8	7 39·5	1 6 37·4	4 30 38·46	8 35 58·94
—	α Serpentis....	14 6	14 33·5	1 15 1	15 29	15 57	1 15 1·3	4 30 39·11	8 44 22·19
July 1	⊙'s {1st Limb	14 24·2	14 54	4 15 24	15 54	16 24			
	⊙'s {2d Limb	16 41·5	17 11·5	4 17 41	18 10·7	18 41·5	4 16 32·64	4 31 47·51	11 44 45·13
P.M.	ζ Virginis	0 45·5	1 13	11 1 40	2 8	2 36	11 1 40·5	4 32 18·09	6 29 22·41
—	τ Bootis	13 49	14 18	11 14 46·5	15 15·5	15 45	11 14 46·8	4 32 19·09	6 42 27·71
—	η "	21 12	21 41·2	11 22 9·5	22 39	23 8·5	11 22 10·04	4 32 19·66	6 49 50·38
—	α Draconis....	33 6·5	34 12	11 35 16	36 21·5	37 28·5	11 35 16·9	4 32 20·66	7 2 56·24
—	Arcturus	42 27·5	42 57	11 43 25·5	43 54·5	44 25	11 43 25·9	4 32 21·28	7 11 4·62
—	γ Bootis.....	59 31	60 6·5	12 0 41·5	1 16·5	1 53	12 0 41·7	4 32 22·59	7 28 19·11
—	π "	7 14·5	7 43·5	12 8 11·5	8 40·5	.....	12 8 11·81	4 32 23·16	7 35 48·65
—	ε "	.....	.....	12 13 0	13 31	14 2·5	12 12 59·89	4 32 23·53	7 40 36·36
—	ξ "	18 0·5	18 30	12 — —	19 28	19 57·5	12 18 59	4 32 23·99	7 46 35·01

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
July 1	β Ursæ Min. . .	23 7	24 52·5	12 26 37	28 22	30 10	12 26 37·7	4 32 24·57	7 54 13·13
P.M.	c Bootis	34 12·2	34 43·2	12 35 13·5	35 43·5	36 14·5	12 35 13·38	4 32 25·22	8 2 48·16
—	δ „	42 54·5	43 27·5	12 44 0·5	44 33·5	45 7·5	12 44 0·7	4 32 25·89	8 11 34·81
—	☽'s 1st Limb. .	53 42·7	54 11·6	12 54 40·2	55 8·5	55 38	12 54 40·2	4 32 26·73	8 22 13·47
—	γ Libræ	0 25·5	0 54	1 1 22	1 50·5	2 19·5	13 1 22·3	4 32 27·24	8 28 55·06
—	η „	. . . . .	9 22	1 — —	10 19	10 48	13 9 50·48	4 32 27·89	8 37 22·59
—	Antares	53 11·5	53 42	1 54 12·5	54 43	55 14	13 54 12·6	4 32 31·29	9 21 41·31
2	☉'s 1st Limb	14 42·5	15 12·5	4 15 42	16 12	16 42·5	4 16 50·82	4 33 36·76	11 43 14·06
	☉'s 2d Limb	16 59·7	17 29·5	4 17 59	18 29	18 59·5			
				End of Pendulum Experiments.					
				Observations for the Longitude by Chron. 699.					
P.M.	θ Libræ	11 13·2	11 42·4	8 12·10	12 38·8	13 7·8	8 12 10·44		
—	49 „	17 51	18 19·4	8 18 47·6	19 16·2	19 45·4	8 18 47·92		
—	☽'s 1st Limb. .	37 10·6	37 40·2	8 38 9	38 38	39 7·5	8 38 9·06		
—	Antares	45 54·2	46 25	8 46 55	47 25·8	47 57	8 46 55·4		
	By the comparison at noon, July 2d, with 699 and 929, the Chron. 699 was slow of mean time at 22^m past noon								h m s 0 49 59·53.
3	☉'s 1st Limb	11 13·6	11 44	11 12 13·2	12 43·6	13 13·4	11 13 22·1		
	☉'s 2d Limb	13·31	14 1	11 14 30·2	15 0·2	15 30·8			
P.M.	Antares	41 34·8	42 5	8 42 35·6	43 5·8	43 37·6	8 42 35·76		
—	m Scorpii.	54 21	54 50	8 55 17·8	55 47·2	56 16·8	8 55 18·56		
—	(251) Ophiuchi	12 23·8	12 52·4	9 13 20·8	13 50	14 18·2	9 13 21·04		
—	☽'s 1st Limb. .	25 43·6	26 13	9 26 42	27 11·2	27 41·8	9 26 42·32		
5	Antares	32 53·8	. . . . .	8 35 54·2	34 24·8	34 56·6	8 33 54·7		
P.M.	r Sagittarii. . . .	53 5·8	53 35·2	10 54 3·8	54 33·4	55 3·2	10 54 4·28		
—	*	. . . . .	3 22·2	11 3 51	4 20	4 49·8			
—	☽'s 1st Limb. .	8 15	8 45	11 9 13·8	9 43·2	. . . . .	11 9 13·68		
—	d Sagittarii. . . .	21 7·4	21 36·6	11 22 5	22 34·2	23 3·8	11 22 5·4		
6	α Herculis	16 20·5	16 49	9 17 17	17 46	18 14·6	9 17 17·42		
P.M.	d Sagittarii. . . .	. . . . .	. . . . .	11 17 44	18 13	18 43	Chronometer losing 25''·09		in sid. day.

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APPENDIX. TABLE II.—Fernando de Noronha.

—	ζ^1 " ..	.....	.....	11 — —	22 26·8	22 56	11 21 57·58					
—	[1294] " ..	.....	27 44	11 28 12·5	28 42	29 11	11 28 12·71					
—	☽'s 2d Limb ..	3 15·5	3 45·2	12 4 14	4 44	5 13·6	12 4 14·46					
—	α^2 Capricorni ..	17 32·4	18 0·2	12 18 28·4	18 56·6	19 25·4	12 18 28·6					
—	β^2 " ..	20 21·2	20 50·4	12 21 18	21 46·8	22 15·8	12 21 18·44					
7	α Herculis	11 59	.....	9 — —	.....	13 53	9 12 56					
P.M.	α^2 Capricorni ..	13 10·6	13 38·8	12 14 6·6	14 35·2	15 4	12 14 7·04					
—	β^2 " ..	.....	16 28·4	12 16 56	.....	.....	12 16 56·24					
—	(194) " ..	30 24	30 53	12 31 21	31 50·2	32 19·2	12 31 21·48					
—	(240) " ..	35 27·5	35 56	12 36 24·2	36 53·2	27 22·8	12 36 24·74					
—	ϵ 's 2d Limb ..	56 0·4	56 29·6	12 56 58	57 27·6	57 57	12 56 58·52					
8	α^2 Capricorni ..	.....	.....	12 — —	10 12·2	.....	.....	rate—26·73				
P.M.	β^2 " ..	.....	.....	12 12 34	13 2·2	13 31·2	12 12 33·77					
—	α Cygni	35 22	36 0·8	12 36 38·4	37 17·2	38 56·2	12 36 38·92					
9	☉'s 1st Limb	.....	.....	11 10 41·8	11 11	11 41·8	11 11 49·64					
	☉'s 2d Limb	11 58·2	12 28	11 12 57·4	13 27	13 57·8						
P.M.	β Aquarii.....	18 11·2	18 39·2	1 19 6	19 34	20 2·2						
—	β Cephei	.....	.....	1 — —	24 12	25 33·8						
—	α Aquarii	.....	.....	1 53 26·5	53 53·2	54 22						
10	☉'s 1st Limb	.....	9 53·2	11 10 22·8	10 52·2	11 21·8	11 11 30·99	2 49 25·93	8 22 5·06			
	☉'s 2d Limb	11 40	12 9·4	11 12 39	13 8·6	13 39·2						
11	☉'s 1st Limb	9 5	9 34·8	11 10 4·2	10 34	11 4	11 11 12·65	2 48 55·3	8 22 17·35			
	☉'s 2d Limb	11 21·6	11 51	11 12 20·2	12 50·2	13 20·5						
12	☽'s 2d Limb..	.....	12 53·4	17 13 21	13 49·4	14 18·2	17 13 21·02					
or 13 A.M.	α Ceti	34 47	35 14	18 35 41·4	36 8·6	36 37·4	18 35 41·68					
13	☉'s 1st Limb	8 24·8	8 54	11 9 23·4	9 53·4	10 23·4	11 10 31·86					
	☉'s 2d Limb	10 41	11 10	11 11 39·8	12 9	12 39·8						
14	☽'s 2d Limb..	4 45·5	5 13·9	18 5 42·4	6 10·4	6 40	18 5 42·44					
A.M.	α Ceti	30 22·4	30 50	18 31 17	31 44·9	31 12·8	18 31 17·42					
15	α Ceti	25 58·2	26 25·6	19 26 52·8	27 20·2	27 48·4	18 26 53·04					
A.M.	ϵ 's 2d Limb..	.....	.....	18 59 34·2	60 3·4	60 32·8	18 59 34.48					
—	Aldebaran	58 24·8	58 53·2	19 59 21·4	59 50·4	60 19·2	19 59 21·8					

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
July 15	⊙'s 1st Limb	7 41·2	8 11	11 8 40·6	9 9·8	9 40·6	11 9 48·46		
	⊙'s 2d Limb	9 57	10 27	11 10 55·8	11 25·8	11 55·8			
16	☽'s 2d Limb..	54 1	54 30·4	19 54 59·4	55 28·8	55 58·6	19 54 59·64		
A.M.	β Tauri	.....	43 40	20 44 10·2	44 42	45 13·2	20 44 10·55		
17	β Tauri.....	.....	39 14·6	20 39 45·6	40 16·6	40 48·8	20 39 45·6		
A.M.	☾'s 2d Limb..	50 28	50 57·4	20 51 26·8	51 56·2	52 26·4	20 51 26·96		
Noon	⊙'s 1st Limb	.....	7 25·4	11 7 54·4	8 24	8 54·4	11 9 2·81		
	⊙'s 2d Limb	9 11·8	9 41·6	11 10 10·2	10 40	11 9·8			
				Maranham.					
August 3	Antares	37 47	37 17·8	5 38 48	39 18·5	39 49·5	5 38 48·16	1 52 21·77	7 31 9·93
P.M.	τ Scorpii.....	44 4·2	44 35·4	5 45 6	45 37	46 8·5	5 45 6·22	1 52 21·21	7 37 27·43
—	α Triang. Aust.	48 10·5	49 27	5 50 41	51 57	53 14	5 50 41·9	1 52 20·75	7 43 2·65
—	ε Aræ.....	4 21	5 7	6 5 51·5	6 37	7 23·5	6 5 52	1 52 19·48	7 58 11·48
—	*k* Scorpii	12 17	12 50	6 13 22·4	13 55·5	14 29	6 13 22·78	1 52 18·86	8 5 41·64
—	η Ophiuchi ...	19 22	19 51	6 20 18·5	20 47·4	21 16·3	6 20 19·04	1 52 18·29	8 12 37·33
—	A ,, ...	23 34·5	24 5	6 24 35·5	25 6	25 37·2	6 24 35·64	1 52 17·93	8 16 53·57
—	λ Scorpii	40 35·5	41 10	6 41 43·5	.....	42 53	6 41 43·97	1 52 16·5	8 34 0·47
—	η Pavonis.....	46 41·5	47 45·5	6 48 48·5	49 53	50 58·5	6 48 49·4	1 52 15·92	8 41 5·32
—	γ Telescopii...	56 46	.....	6 57 54·5	58 29	59 4	6 57 54·78	1 52 15·07	8 50 9·85
—	ν Ophiuchi....	8 17·5	8 45·5	7 9 13	9 41	10 9	7 9 13·2	1 52 14·13	9 1 27·33
4	Antares	33 58·2	34 28·5	5 34 59	35 29·5	36 0·5	5 34 59·14	1 50 21·51	7 25 20·65
—	τ Scorpii	40 15	40 46·5	5 41 17	41 48	42 19·5	5 41 17·2	1 50 20·97	7 31 38·17
—	α Triang. Aust.	44 21·5	45 37	5 46 51·5	48 7	49 24	5 46 52·2	1 50 20·49	7 37 12·69
—	ε Aræ.....	0 32	1 17·5	6 2 2·5	2 48	3 34·5	6 2 2·9	1 50 19·22	7 52 22·12
—	*k* Scorpii	8 28	9 1	6 9 33·5	10 6·5	10 40·5	6 9 33·9	1 50 18·63	7 59 52·53
—	η Ophiuchi....	15 33·5	16 2	6 16 30	16 58·5	17 27·5	6 16 30·3	1 50 18·1	8 6 48·4
—	A , ...	19 45·5	20 16	6 20 46·2	21 17	21 48	6 20 46·54	1 50 17·63	8 11 4·17
—	α Aræ.....	33 12	33 54	6 34 36	35 18·5	36 1·5	6 34 36·4	1 50 16·57	8 24 52·97

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APPENDIX. *TABLE II.—Maranham.*

—	λ Scorpii	36 46·5	37 21	6 37 55	38 29·5	39 4·5	6 37 55·3	1 50 16	8 28 11·3
—	η Pavonis.....	42 53·5	43 57	6 45 0	46 4·5	47 10	6 45 1	1 50 15·6	8 35 16·6
—	γ Telescopii...	52 57·5	...·....	6 54 5·5	54 40	55 15	6 54 5·9	1 50 14·73	9 44 20·63
—	ν Ophiuchi....	4 28·5	4 56·5	7 5 24	5 52	6 20·5	7 5 24·3	1 50 13·87	8 55 38·17
5	Antares	30 9	30 39·5	5 31 10	31 40·5	32 11·5	5 31 10·1	1 48 21·26	7 19 31·36
—	τ Scorpii	36 26·2	36 57·5	5 37 28·5	37 59	38 30·5	5 37 28·34	1 48 20·76	7 25 49·1
—	α Triang. Aust.	40 33	41 48·5	5 43 2·5	44 18·5	45 35·5	5 43 3·6	1 48 20·26	7 31 23·86
—	ε Ara	56 43	57 28·5	5 58 13·5	58 59	59 45·5	5 58 13·9	1 48 18·99	7 46 32·89
—	k Scorpii	4 39·2	5 12	6 5 45	6 18	6 51·5	6 5 45·14	1 48 18·36	7 54 3·5
—	η Ophiuchi....	11 44·5	12 13	6 12 41	13 9·5	13 38·8	6 12 41·36	1 48 17·78	8 0 59·14
—	A ,, ...	15 56·5	16 27	6 16 57·5	17 28	17 59·5	6 16 57·7	1 48 17·42	8 5 15·12
—	α Ara	29 23	30 5·5	6 30 47·5	31 30	32 13	6 30 47·8	1 48 16·27	8 19 4·07
—	λ Scorpii	32 58	33 32·5	6 34 6·5	34 40·5	35 15·5	6 34 6·6	1 48 15·99	8 22 22·59
—	η Pavonis.....	39 3·6	40 8·5	6 41 11	42 16	43 21·5	6 41 12·12	1 48 15·39	8 29 27·51
—	γ Telescopii...	49 8·5	49 43	6 50 17	50 51·5	51 26·5	6 50 17·3	1 48 14·63	8 38 31·93
—	ν Ophiuchi....	0 39·5	1 7·5	7 1 35	2 3	2 31·2	7 1 35·24	1 48 13·69	8 49 46·93
6	Antares	26 20	26 50·7	5 27 21	27 51·5	28 22·5	5 27 21·14	1 46 21·08	7 13 42·22
—	τ Scorpii	32 37·5	33 8·5	5 33 39	34 10·5	34 42	5 33 39·5	1 46 20·58	7 20 0·08
—	α Triang. Aust.	36 43·5	37 59	5 39 13	40 29·5	41 46·5	5 39 14·3	1 46 20·11	7 25 34·41
—	ε Ara.....	52 54	53 39·5	5 54 24·5	55 10·5	55 56·8	5 54 25·06	1 46 18·84	7 40 43·9
—	k Scorpii	0 50	1 23	6 1 55·5	2 28·5	3 2·5	6 1 55·9	1 46 18·21	7 48 14·11
—	η Ophiuchi....	7 55·5	8 24	6 8 52	9 20·5	9 49·5	6 8 52·3	1 46 17·63	7 55 9·93
—	A ,, ...	12 7·5	12 38	6 13 8	13 39	14 10·5	6 13 8·6	1 46 17·27	7 59 25·87
7	Antares	22 31	23 1·5	5 23 32	24 2·5	24 33·5	5 23 32·1	1 44 20·99	7 7 53·09
—	τ Scorpii	28 48·5	29 19·5	5 29 50	30 21·5	30 53	5 29 50·5	1 44 20·46	7 14 10·96
—	α Triang. Aust.	32 55	34 10·5	5 35 25	36 40·5	37 58	5 35 25·8	1 44 20·01	7 19 45·81
—	ε Ara.....	49 5	49 50·5	5 50 35·5	51 21	52 7·5	5 50 35·9	1 44 18·76	7 34 54·66
—	k Scorpii	57 1	57 34	5 58 6·5	58 40	59 13·5	5 58 7	1 44 18·1	7 42 25·1
—	η Ophiuchi....	4 6·5	4 35	6 5 3	5 31·5	6 0·5	6 5 3·3	1 44 17·52	7 49 20·82
—	A ,, ...	8 18·5	8 49	6 9 19·5	9 50	10 21·5	6 9 17·7	1 44 17·24	7 53 36·94
—	α Ara.....	21 44·5	22 27·2	6 23 9	23 51·5	24 35	6 23 9·44	1 44 15·99	8 7 25·43
—	λ Scorpii	25 20	25 54	6 26 28	27 2·5	27 37·5	6 26 28·4	1 44 15·71	8 10 44·11

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
August 7	η Pavonis.....	31 25·6	32 30	6 33 33·5	34 37·5	35 43	6 33 33·92	1 44 15·11	8 17 49·03
P.M.	γ Telescopii...	41 30	42 5	6 42 38·5	43 13·5	43 48·5	6 42 39·1	1 44 14·16	8 26 53·26
—	ν Ophiuchi....	53 1·5	53 29·5	6 53 57	54 25	54 53·5	6 53 57·3	1 44 13·4	8 38 10·7
8	Antares	.....	19 12·8	5 19 43	20 13·5	.....	5 19 43·1	1 42 21	7 2 4·1
—	τ Scorpii.....	25 0	25 30·8	5 26 1·5	26 32·5	27 4	5 26 1·76	1 42 20·47	7 8 22·23
—	α Triang. Aust.	29 7	30 22	5 31 36·5	32 52	34 9·5	5 31 37·4	1 42 20·01	7 13 57·41
—	ε Aræ.....	45 16·5	.....	5 — —	47 32·5	48 19	5 46 47·5	1 42 18·91	7 29 6·41
—	k Scorpii.....	53 12·5	53 45·5	5 54 18	54 51	55 25	5 54 18·4	1 42 18·12	7 36 36·52
—	η Ophiuchi....	0 17·5	0 46	6 1 14	1 42·5	2 11·5	6 1 14·3	1 42 17·45	7 43 31·75
—	A „	4 29·5	5 0	6 5 30·5	6 1·2	6 32·5	6 5 30·74	1 42 17·09	7 47 47·83
—	λ Scorpii	.....	.....	6 — —	20 22·5	20 57·5	6 19 47·97	1 42 15·94	8 2 3·91
—	γ Telescopii...	37 41·5	38 16	6 38 50	39 24·4	39 59·5	6 38 50·28	1 42 14·33	8 21 4·61
—	ν Ophiuchi ...	.....	49 40·8	6 — —	.....	51 4·9	6 50 8·43	1 42 13·39	8 32 21·82
9	Antares	14 53·2	15 23·5	5 15 54	16 24·5	16 55·5	5 15 54·14	1 40 21·14	6 56 15·28
—	τ Scorpii.....	21 10	21 41·5	5 22 12	22 43	23 14·5	5 22 12·2	1 40 20·61	7 2 32·81
—	α Triang. Aust.	25 16·5	26 32·5	5 27 46·5	29 2·5	30 19·5	5 27 47·5	1 40 20·14	7 8 7·64
—	ε Aræ.....	41 27	42 12·5	5 42 57	43 43	44 29·5	5 42 57·8	1 40 18·86	7 23 16·66
—	k Scorpii.....	49 23	49 56·2	5 50 28·5	51 1·5	51 35·5	5 50 28·94	1 40 18·23	7 30 47·17
—	η Ophiuchi ...	56 28·5	56 57	5 57 24·5	57 53	58 22·5	5 57 25·1	1 40 17·64	7 37 42·74
—	A „ ...	0 40	1 11	6 1 41	2 11·5	2 43	6 1 41·3	1 40 17·29	7 41 58·59
—	α Aræ	14 6·5	14 49·2	6 15 31	16 13·5	16 57	6 15 31·44	1 40 16·13	7 55 47·57
—	λ Scorpii	17 42	18 16	6 18 50	19 24·5	19 59·5	6 18 50·4	1 40 15·84	7 59 6·24
—	η Pavonis.....	23 48·5	24·52	6 25 55	26 59·5	28 5	6 25 56	1 40 15·25	8 6 11·25
—	γ Telescopii ...	33 52	34 26·5	6 35 0·5	35 35	36 10	6 35 0·8	1 40 14·49	8 15 15·29
10	Antares.....	11 3·5	11 34	5 12 4	12 35	13 6	5 12 4·5	1 38 21·41	6 50 25·91
—	τ Scorpii	17 20·5	17 51·5	5 18 22	18 53·2	19 25	5 18 22·44	1 38 20·9	6 56 43·34
—	α Triang. Aust.	21 26·5	22 42	5 23 56·5	25 12	26 29·5	5 23 57·3	1 38 20·49	7 2 17·79
—	ε Aræ	37 37	38 23	5 39 7·5	39 53	40 39·5	5 39 8	1 38 19·17	7 17 27·17
—	k Scorpii	45 33·5	46 6	5 46 38·5	47 12	47 45·5	5 46 39·1	1 38 18·54	7 24 57·64
—	η Ophiuchi ...	52 38·5	53 7	5 53 35	54 4	54 33	5 53 35·5	1 38 17·95	7 31 53·45

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—	A „ ...	56 50·5	57 21	5 57 51·5	58 22	58 53·5	5 57 51·7	1 38 17·61	7 36 9·31
—	α Aræ	10 16·5	10 59	6 11 41	12 23·5	13 7	6 11 41·4	1 38 16·44	7 49 57·84
—	λ Scorpii	13 52	14 26·5	6 15 0	15 34·5	16 9·5	6 15 0·5	1 38 16·16	7 53 16·66
—	η Pavonis.....	19 58	21 2	6 22 5·5	23 10	24 15·5	6 22 6·2	1 38 15·57	8 0 21·77
—	γ Telescopii...	30 2	30 37	6 31 10·5	31 45	32 20·4	6 31 10·98	1 38 14·81	8 9 25·79
—	ν Ophiuchi....	41 34	42 1·5	6 42 29	42 57	43 25·5	6 42 29·4	1 38 13·86	8 20 43·26
11	Antares	7 14	7 44·5	5 8 14·7	8 45	9 16·5	5 8 14·94	1 36 21·44	6 44 36·38
—	τ Scorpii	13 31	14 2	5 14 32·5	15 4	15 35·5	5 14 33	1 36 20·91	6 50 53·91
—	α Triang. Aust.	17 37	18 53	5 20 7·5	21 23	22 40·5	5 20 8·2	1 36 20·44	6 56 28·64
—	ε Aræ.....	33 48	34 33	5 35 18	41 4	41 50·5	5 35 18·7	1 36 19·17	7 11 37·87
—	*k* Scorpii	41 44	42 16·5	5 42 49·5	43 22·5	43 56	5 42 49·7	1 36 18·55	7 19 8·25
—	η Ophiuchi ...	48 49	49 17·5	5 49 45·5	50 14·5	50 43·5	5 49 46	1 36 17·95	7 26 3·95
—	A „ ...	53 1·6	53 31·5	5 54 2	54 33	55 4	5 54 2·42	1 36 17·59	7 30 20·01
—	α Aræ.....	6 27·5	7 10	6 7 51·5	8 34·5	9 18	6 7 52·3	1 36 16·43	7 44 8·73
—	λ Scorpii	10 3	10 37	6 11 10·5	11 45	12 20	6 11 11·1	1 36 16·15	7 47 27·25
—	η Pavonis.....	16 9	17 12·5	6 18 15·5	19 20	20 25·5	6 18 16·5	1 36 15·56	7 54 32·06
—	γ Telescopii...	26 13	26 47·5	6 27 21	27 56	28 31	6 27 21·7	1 36 14·79	8 3 36·49
—	ν Ophiuchi ...	37 44	38 12	6 38 39·5	39 7·5	39 36·5	6 38 39·9	1 36 13·84	8 14 53·74
12	Antares	3 24·5	3 65	5 4 25·5	4 56	5 27	5 4 25·6	1 34 21·43	6 38 47·03
—	τ Scorpii	9 42	10 13	5 10 44	11 15	11 46·5	5 10 44·1	1 34 20·77	6 45 4·87
—	α Triang. Aust.	13 48·8	15 4·5	5 16 18·7	17 35	18 51·5	5 16 19·7	1 34 20·43	6 50 40·13
—	ε Aræ.....	29 59·2	30 44·5	5 31 29	32 15	33 1·5	5 31 29·84	1 34 19·08	7 5 48·92
—	*k* Scorpii	37 54·5	38 27·5	5 39 0	39 33·5	40 7	5 39 0·5	1 34 18·52	7 13 19·02
—	η Ophiuchi ...	45 0	45 28·2	5 45 56·5	46 25	46 54·5	5 45 56·84	1 34 17·99	7 20 14·88
—	A „ ...	49 12	49 42·5	5 50 13	50 43·5	51 15	5 50 13·2	1 34 17·57	7 24 30·77
—	α Aræ	2 38·5	3 21	6 4 2·8	4 45	5 28·5	6 4 3·16	1 34 16·42	7 38 19·58
—	λ Scorpii	6 13·5	6 48	6 7 22	7 56·5	8 31	6 7 22·2	1 34 16·16	7 41 38·36
—	η Pavonis.....	12 20	13 24	6 14 27·5	15 31·5	16 36·5	6 14 27·9	1 34 15·54	7 48 43·44
—	γ Telescopii...	22 23·5	22 58·5	6 23 32·5	24 6·5	24 42	6 23 32·6	1 34 14·78	7 57 47·38
—	ν Ophiuchi....	33 55	34 23	6 34 50·5	35 19	35 47·2	6 34 50·94	1 34 13·74	8 9 4·68
		Commencement of Experiments with Convertible Pendulums.							
19	λ Scorpii	39 25	39 59·5	5 40 33·5	41 7·5	41 42·5	5 40 33·6	1 5 57·37	6 46 30·97

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Appendix. Table II.—Maranham.

1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
August 19	η Pavonis.....	45 31·5	46 35·5	5 47 38·5	48 43	49 48·5	5 47 39·4	1 5 57·24	6 53 36·64
P.M.	γ Telescopii...	55 35·5	56 10	5 56 43·9	57 18·5	57 53·2	5 56 43·62	1 5 57·08	7 2 40·7
—	ν Ophiuchi....	7 6·6	7 34·5	6 8 2	8 30	8 58	6 8 2·22	1 5 56·88	7 13 59·1
—	ε Telescopii ...	15 43·5	16 22·5	6 17 1·5	17 41	18 21·5	6 17 2	1 5 56·72	7 22 58·72
—	ϕ Sagittarii ...	20 58	21 27·5	6 21 56·5	22 26·2	22 56	6 21 56·84	1 5 56·66	7 27 53·5
—	δ „ ...	27 24·5	27 56	6 28 27·5	28 59	29 31	6 28 27·6	1 5 56·52	7 34 24·12
—	α Telescopii...	31 25·5	32 5	6 32 44	33 24	34 4	6 32 44·5	1 5 56·45	7 38 40·95
—	Clyp. Sobie....	36 52	37 19·2	6 37 48·5	38 17	38 45·5	6 37 48·44	1 5 56·36	7 43 44·8
—	ϕ Sagittarii...	52 17	52 48	6 53 18·5	53 49·5	54 21	6 53 18·8	1 5 56·08	7 59 14·98
20	λ Scorpii.....	35 36	36 10·5	5 36 44·2	37 18·5	37 53·5	5 36 44·54	1 5 31·66	6 42 16·2
—	η Pavonis.....	41 42	42 45·5	5 43 48·5	44 53·2	45 58·5	5 43 49·54	1 5 31·53	6 49 21·07
—	ν Ophiuchi....	3 18	3 45·5	6 4 13·5	4 41	5 9·5	6 4 13·5	1 5 31·17	7 9 44·67
—	ν Telescopii...	11 53·5	12 33	6 13 12	13 51·5	14 32	6 13 12·4	1 5 31·01	7 18 43·41
—	μ' Sagittarii ...	17 9·5	17 38·5	6 18 07·5	18 37·5	19 7	6 18 8	1 5 30·92	7 23 38·92
—	δ „ ...	23 35·5	24 7	6 24 38	25 10	25 42·5	6 24 38·6	1 5 30·8	7 30 9·4
—	α Telescopii...	27 36·5	28 16	6 29 55	29 34·5	30 15	6 29 55·4	1 5 30·71	7 34 26·11
—	Clyp. Sobie ...	33 3	33 31·2	6 33 59	34 27·8	34 56·5	6 33 59·5	1 5 30·63	7 39 30·13
—	ϕ Sagittarii ...	48 28·5	48 59	6 49 28·5	50 0·5	50 31·7	6 49 29·64	1 5 30·36	7 55 0
21	λ Scorpii	31 47·5	32 22	5 32 56	33 30·5	34 5	5 32 56·2	1 5 6·29	6 38 2·49
—	η Pavonis.....	37 54	38 58	5 40 1·3	41 5·4	42 11	5 40 1·94	1 5 6·16	6 45 8·1
—	γ Telescopii...	47 58	48 32	5 49 6	49 40·5	50 16	5 49 6·5	1 5 6	6 54 12·5
—	ν Ophiuchi ...	.....	.....	6 0 24·5	0 52·5	1 21	6 0 24·56	1 5 5·84	6 5 30·4
—	ε Telescopii...	8 5	8 44·5	6 9 23·5	10 3	10 44	6 9 24	1 5 5·64	7 14 29·64
—	μ' Sagittarii...	13 20·5	13 50	6 14 19	14 48·5	15 18·5	6 14 19·3	1 5 5·56	7 19 24·86
—	δ „ ...	19 46·5	20 18·5	6 20 49·5	21 21·4	21 53·5	6 20 49·88	1 5 5·44	7 25 55·32
—	α Telescopii...	23 48	24 27·5	6 25 6	25 46	26 26·5	6 25 6·8	1 5 5·33	7 30 12·13
—	Clyp. Sobie ...	29 14	29 42·5	6 30 10·5	30 39	31 8	6 30 10·8	1 5 5·24	7 35 16·04
—	ϕ Sagittarii ...	44 39·5	45 10·5	6 45 40·5	46 11·5	46 43	6 45 41	1 5 4·96	7 50 45·96
22	λ Scorpii	27 58·5	28 33	5 29 6·5	29 41	30 16	5 29 7	1 4 41·03	6 33 48·03
—	η Pavonis.....	34 4·8	35 9	5 36 11·5	37 16	38 21·5	5 36 12·56	1 4 40·92	6 40 53·48

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APPENDIX. *TABLE II.—Maranham.*

—	γ Telescopii ...	44 9·2	44 43·5	5 45 17·5	45 51·5	46 27	5 45 17·74	1	4 40·75	6 49 58·49
—	ν Ophiuchi	55 40	56 8	5 56 35·5	57 3·5	57 32	5 56 35·8	1	4 40·66	7 1 16·46
—	ε Telescopii ...	4 16·5	4 55·5	6 5 35	6 14·5	6 55	6 5 35·3	1	4 40·39	7 10 15·69
—	μ′ Sagittarii ...	9 31·2	10 1	6 10 30	11 0	11 30	6 10 30·44	1	4 40·32	7 15 10·76
—	δ ,, ...	15 57·5	16 29·5	6 17 0·5	17 32·5	18 4·5	6 17 0·9	1	4 40·19	7 21 41·09
—	α Telescopii ...	19 59	20 38·5	6 21 17·5	21 57	22 37·5	6 21 17·9	1	4 40·13	7 25 59·03
—	Clyp. Sobie ...	25 25	25 54	6 26 22	26 50	27 19	6 26 22	1	4 39·92	7 31 1·92
—	φ Sagittarii ...	40 50·5	41 21·5	6 41 51·5	42 22·5	42 54	6 41 52	1	4 39·74	7 46 31·74
23	λ Scorpii	24 9·5	24 44	5 25 17·5	25 52	26 27	5 25 18	1	4 15·14	6 29 33·14
—	η Pavonis.....	30 15	31 18·5	5 32 22	33 36	34 32·5	5 32 22·8	1	4 15	6 36 37·8
—	γ Telescopii ...	.....	5 41 28	42 2·5	42 38	5 41 28·19	1	4 14·83	6 45 43·02
—	ν Ophiuchi ...	51 51·5	52 19·5	5 52 47	53 14·5	53 43·5	5 52 47·2	1	4 14·64	6 57 1·84
—	ε Telescopii ...	0 27	1 6·5	6 1 45·5	2 25	3 5·5	6 1 45·9	1	4 14·47	7 6 0·37
—	μ′ Sagittarii ...	5 42·5	6 12	6 6 41·4	7 10·5	7 41	6 6 41·48	1	4 14·38	7 10 55·86
—	δ ,, ...	12 9	12 40·8	6 13 12	13 43·5	14 16	6 13 12·26	1	4 14·27	7 17 26·53
—	α Telescopii ...	16 9·5	16 49·5	6 17 28·5	18 8·5	18 48·5	6 17 28·9	1	4 14·19	7 21 43·09
—	Clyp. Sobie ...	21 36·5	22 5	6 22 33	23 1·8	23 30·5	6 22 33·36	1	4 14·09	7 26 47·45
—	φ Sagittarii ...	.....	37 32·5	6 38 3	38 34	39 5·5	6 38 3·31	1	4 13·81	7 42 17·12
24	No Stars observed this evening in consequence of the clouded state of the sky; there being also rain occasionally with lightning; but no thunder at this time, although during the afternoon it was very heavy.									
25	λ Scorpii	16 32	17 6	5 17 40	18 14·5	18 49·5	5 17 40·4	1	3 23·57	6 21 3·97
—	η Pavonis.....	22 38	23 42·5	5 24 45·5	25 49·5	26 55	5 24 46·1	1	3 23·44	6 28 9·54
—	γ Telescopii ...	32 42·5	33 17	5 33 51	34 25	35 0·2	5 33 51·14	1	3 23·27	6 37 14·41
—	ν Ophiuchi....	44 13·5	44 41·5	5 '45 9	45 37	46 5·5	5 45 9·3	1	3 23·06	6 48 32·36
—	ε Telescopii ...	52 49·5	53 29	5 54 8	54 47·5	55 28	5 54 8·4	1	3 22·89	6 57 31·29
—	μ′ Sagittarii ...	58 5	58 34·5	5 59 3·2	59 33	0 2·5	5 59 3·64	1	3 22·8	7 2 26·44
—	δ ,, ...	4 31·5	5 2·5	6 5 34	6 5·5	6 38	6 5 34·3	1	3 22·67	7 8 56·97
—	α Telescopii ...	8 32	9 11·5	6 9 50·5	10 30·5	11 10·5	6 9 51	1	3 22·58	7 13 13·58
—	Clyp. Sobie ...	13 58·5	14 27	6 14 55	15 23·5	15 52·5	6 14 55·3	1	3 22·4	7 18 17·7
—	φ Sagittarii ...	29 23·5	29 54·5	6 30 25	30 56	31 27·5	6 30 25·3	1	3 22·21	7 33 47·51
26	λ Scorpii	12 42·8	13 17	5 13 51	14 25·5	15 0·5	5 13 51·36	1	2 57·55	6 16 48·91
—	η Pavonis	18 48·2	19 52·5	5 20 56	22 0	23 5·5	5 20 56·44	1	2 57·42	6 23 53·86

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
August 26	γ Telescopii ...	28 53·5	29 28	5 30 1·9	30 36	31 11·5	5 30 2·18	1 2 57·26	6 32 59·44
P.M.	ν Ophiuchi	40 25	40 53	5 41 20	41 48·5	42 17	5 41 20·7	1 2 57·05	6 44 17·75
—	ε Telescopii ...	49 1	49 40	5 50 19	50 59	51 39	5 50 19·6	1 2 56·89	6 53 16·49
—	μ' Sagittarii ...	54 16·5	54 45·5	5 55 14·5	55 44	56 14·5	5 55 15	1 2 56·79	6 58 11·79
—	δ „ ...	0 42·5	1 14	6 1 45·5	2 17	2 49·5	6 1 45·7	1 2 56·68	7 4 42·38
—	α Telescopii ...	4 43·5	5 22·7	6 6 2	6 41·5	7 22	6 6 2·34	1 2 56·6	7 8 58·94
—	Clyp. Sobie ...	10 10	10 38·5	6 11 6·5	11 34·5	12 3·5	6 11 6·6	1 2 56·5	7 14 3·1
—	ϕ Sagittarii ...	25 35	26 6	6 26 36·5	27 7·5	27 39	6 26 36·8	1 2 56·23	7 29 33·03

Para.

1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with 1st Clock.	Comparison with 2nd Clock.	1st Clock at Transit.	2nd Clock at Transit.
		m s	m s	m s	m s	m s	h m s	h m s	h m s	h m s	h m s
Sept. 18	γ Hydri...	29 58·5	31 43·5	33 26	35 10·5	36 57	2 33 27·1	1 28 34·24	0 31 19·07	4 2 1·34	3 4 46·17
—	γ Reticuli .	39 41·5	40 41	41 40	42 39·5	43 40·5	2 41 40·5	1 28 33·52	0 31 18·91	4 10 14·02	3 12 59·41
—	41 Eridani.	53 22·5	53 55·5	54 28	55 1·5	55 35·5	2 54 28·6	1 28 32·5	0 31 18·66	4 23 1·1	3 25 47·26
—	43 „ .	59 32·5	0 6	0 39	1 12	1 46	3 0 39·1	1 28 31·99	0 31 18·54	4 29 11·09	3 31 57·64
—	ν^3 „ .	10 50·5	11 22	11 53·5	12 25·5	12 58	3 11 53·9	1 28 31·07	0 31 18·32	4 40 24·97	3 43 12·22
—	54 „ .	14 57	15 26	15 55	16 24	16 54	3 15 55·2	1 28 30·75	0 31 18·29	4 44 25·95	3 47 13·49
—	β Cœli Scal.	17 51	18 26	19 0	19 35	20 9·5	3 19 0·3	1 28 30·5	0 31 18·19	4 47 30·8	3 50 18·49
19	Clouded sky, no observations obtained this morning.										
20	γ Hydri...	22 22·5	24 6·5	25 50	27 34·5	29 20·5	2 25 50·8	1 24 40·56	0 30 22·15	3 50 31·36	2 56 12·95
—	γ Reticuli .	32 5	33 4·5	34 3·5	35 3	36 4·5	2 34 4·1	1 24 39·85	0 30 21·99	3 58 43·95	3 4 26·09
—	41 Eridani.	45 46·4	46 19·5	46 52	47 25·4	47 59	2 46 52·46	1 24 38·83	0 30 21·74	4 11 31·29	3 17 14·2
—	43 „	51 56·5	52 29·5	53 2·5	53 36	54 10	2 53 2·9	1 24 38·31	0 30 21·62	4 17 41·21	3 23 24·52
—	ν^3 „	3 14	3 46	4 17·5	4 49·5	5 22·5	3 4 17·9	1 24 37·4	0 30 21·4	4 28 55·3	3 34 39·3
—	54 „	7 21	7 50	8 18·9	8 48	9 18	3 8 19·18	1 24 37·08	0 30 21·31	4 32 56·26	3 38 40·49
—	β Cœli Scal.	10 15·2	10 50	11 24	11 58·5	12 34	3 11 24·34	1 24 36·82	0 30 21·26	4 36 1·16	3 41 45·6
21	γ Hydri...	18 33·5	20 18	22 0·5	23 45	25 31·8	2 22 1·76	1 22 43·84	0 29 53·93	3 44 45·6	2 51 55·69

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—	γ Reticuli.	.....	29 16·5	.....	31 14·8	.....	2 30 15·65	1 22 43·16	0 29 53·81	3 52 58·81	3 0 9·46
—	43 Eridani.	48 8	48 41	49 14	49 47·5	50 21·5	2 49 14·4	1 22 41·6	0 29 53·43	4 11 56	3 19 7·83
—	υ^2 „	59 25·5	59 57·5	0 29	1 1	1 33·5	3 0 29·3	1 22 40·67	0 29 53·2	4 23 9·97	3 30 22·5
—	54 „	3 32	4 1·5	4 30	4 59·5	5 29·5	3 4 30·5	1 22 40·34	0 29 53·13	4 27 10·84	3 34 23·63
—	β Cœli Scal.	6 26·5	7 1·5	7 35·5	8 10	8 45·5	3 7 35·8	1 22 40·09	0 29 53·07	4 30 15·89	3 37 28·67
22	γ Hydri...	14 46·5	16 30·5	18 13·2	19 58	21 44·5	2 18 14·54	1 20 46·93	0 29 25·64	3 39 1·47	2 47 40·18
—	γ Reticuli.	24 28·5	25 28·5	26 27	27 26·5	28 27·5	2 26 27·6	1 20 46·25	0 29 25·48	3 47 13·85	2 55 53·08
—	41 Eridani.	38 9	38 42·5	39 15	39 48·5	40 22	2 39 15·4	1 20 45·21	0 29 25·22	4 0 0·61	3 8 40·62
—	43 „	44 19·5	44 52·5	45 25·5	45 59	46 33	2 45 25·9	1 20 44·7	0 29 25·1	4 6 10·6	3 14 51
—	υ^2 „	55 37	56 9	56 40·5	57 12·5	57 45	2 56 40·8	1 20 43·78	0 29 24·87	4 17 24·58	3 26 5·67
—	54 „	59 43·5	60 13	0 41·5	1 11	1 41	3 0 42	1 20 43·45	0 29 24·79	4 21 25·45	3 30 6·79
—	β Cœli Scal.	2 38	3 12·5	3 46·7	4 21·5	4 56·5	3 3 47·04	1 20 43·2	0 29 24·73	4 24 30·24	3 33 11·77
23	γ Hydri...	10 57·2	12 42·5	14 24·5	16 9·5	17 56	2 14 25·94	1 18 49·83	0 28 57·02	3 33 15·77	2 43 22·96
A.M.	γ Reticuli.	20 40	21 39·5	22 39·2	23 38·5	24 39·5	2 22 39·34	1 18 49·15	0 28 56·86	3 41 28·49	2 51 36·2
—	41 Eridani.	34 21	34 54	35 27	36 0·2	36 34	2 35 27·24	1 18 48·11	0 28 56·59	3 54 15·35	3 4 23·83
—	43 „	40 31·5	41 4·5	41 37·5	42 11	42 44·5	2 41 37·8	1 18 47·6	0 28 56·47	4 0 25·4	3 10 34·27
—	υ^2 „	51 49	52 21	52 52·5	53 24·5	53 57	2 52 52·8	1 18 47·28	0 28 56·24	4 11 40·08	3 21 49·04
—	54 „	55 55·5	56 24·8	56 54	57 23	57 53	2 56 54·06	1 18 46·35	0 28 56·16	4 15 40·41	3 25 50·22
—	β Cœli Scal.	58 50·2	59 25	59 59	0 33·5	1 8·5	2 59 59·24	1 18 46·1	0 28 56·1	4 18 45·34	3 28 55·34
24	γ Hydri...	7 10	8 54·5	10 36·5	12 21	14 8	2 10 38	1 16 52·55	0 28 28·25	3 27 30·55	2 39 6·25
A.M.	γ Reticuli.	16 52	17 52	18 50·5	19 50·5	20 51·5	2 18 51·3	1 16 51·9	0 28 28·08	3 35 43·2	2 47 19·38
—	41 Eridani.	30 33·5	31 6·5	31 39	32 12·5	32 46	2 31 39·5	1 16 50·83	0 28 27·82	3 48 30·33	3 0 7·32
—	43 „	36 43·5	37 16·5	37 49·5	38 23	38 57	2 37 49·9	1 16 50·4	0 28 27·69	3 54 40·3	3 6 17·59
—	υ^2 „	48 1	48 33	49 4·5	49 36·5	50 9	2 49 4·8	1 16 49·4	0 28 27·46	4 5 54·2	3 17 32·26
—	54 „	52 7·5	52 37	53 6	53 35	54 5	2 53 6·1	1 16 49·07	0 28 27·38	4 9 55·17	3 21 33·48
—	β Cœli Scal.	55 2	54 36·8	56 11	56 45·5	57 21	2 56 11·26	1 16 48·82	0 28 27·31	4 13 0·08	3 24 38·57
25	γ Hydri...	3 22	5 6·5	6 49	8 33·5	10 20	2 6 50	1 14 54·87	0 27 59·13	3 21 44·87	2 34 49·13
A.M.	γ Reticuli.	13 4·5	14 4·2	15 3	16 2·5	17 3·5	2 15 3·54	1 14 54·2	0 27 58·96	3 29 57·74	2 43 2·5
—	41 Eridani.	26 45	27 18·5	27 51	28 25	28 58·5	2 27 51·6	1 14 53·14	0 27 58·7	3 42 44·74	2 55 50·3
—	43 „	32 55·5	33 28·5	34 1·5	34 35	35 9	2 34 1·9	1 14 52·64	0 27 58·58	3 48 54·54	3 2 0·48
—	υ^2 „	44 13	44 45	45 16·5	45 48·5	46 21	2 45 16·8	1 14 51·72	0 27 58·36	4 0 8·52	3 13 15·16
—	54 „	48 20	48 48·7	49 17·5	49 46·5	50 17	2 49 17·94	1 14 51·39	0 27 58·28	4 4 9·33	3 17 16·22

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with 1st Clock.	Comparison with 2nd Clock.	1st Clock at Transit.	2nd Clock at Transit.
		m s	m s	m s	m s	m s	h m s	h m s	h m s	h m s	h m s
Sept. 25	β Cœli Scal.	51 14·5	51 49	52 23	52 57·7	53 33	2 52 23·44	1 14 51·14	0 27 58·24	4 7 14·58	3 20 21·68
26	γ Hydri...	59 34·5	1 18·2	3 1	4 46	6 33	2 3 2·54	1 12 57·38	0 27 30·41	3 15 59·92	2 30 32·95
A.M.	γ Reticuli.	9 17	10 16·5	11 15·6	12 15	13 15·5	2 11 15·92	1 12 56·7	0 27 30·17	3 24 12·62	2 38 46·09
—	41 Eridani.	22 57	23 30·5	24 3	24 36·5	25 10·5	2 24 3·5	1 12 55·64	0 27 29·99	3 36 59·14	2 51 33·49
—	43 „	29 7·5	29 40·9	30 13·5	30 47	31 20·5	2 30 13·88	1 12 55·13	0 27 29·78	3 43 9·01	2 57 43·66
—	υ^2 „	40 25	40 57	41 28·5	42 0·5	42 33	2 41 28·8	1 12 54·21	0 27 29·56	3 54 23·01	3 8 58·36
—	54 „	44 32	45 1	45 30	45 59	46 29	2 45 30·2	1 12 53·87	0 27 29·48	3 58 24·07	3 12 59·68
—	β Cœli Scal.	47 26·1	48 1	48 35	49 9·8	49 45	2 48 35·38	1 12 53·62	0 27 29·42	4 1 29	3 16 4·8
27	I could not observed	observe the transits this with the Instruments	morning in , as objects	consequence of ill he higher than	alth. The tra $71°\frac{1}{2}$ were	nsits of the M obscured by th	oon and Stars e projecting pa	near her path rt of the roof o	could not be f the house.		
28	γ Hydri ..	51 58·5	53 42·5	55 25·5	57 10	58 56·5	1 55 26·6	1 9 1·83	0 26 32·31	3 4 28·43	2 21 58·91
A.M.	γ Reticuli.	1 40	2 40·2	3 39	4 38·5	5 40	2 3 39·54	1 9 1·08	0 26 32·18	3 12 40·62	2 30 11·72
—	41 Eridani	15 21	15 54·5	16 27·5	17 0·5	17 34·5	2 16 27·6	1 9 0·03	0 26 31·88	3 25 27·63	2 42 59·48
—	43 „	21 32	22 5	22 38	23 11·3	23 45	2 22 38·26	1 8 59·58	0 26 31·83	3 31 37·84	2 49 10·09
—	υ^2 „	32 49·5	33 21·5	33 53	34 25	34 57·5	2 33 53·3	1 8 58·62	0 26 31·55	3 42 51·92	3 0 24·85
—	54 „	36 56	37 25·5	37 54	38 23·5	38 53·5	2 37 54·5	1 8 58·27	0 26 31·46	3 46 52·77	3 4 25·96
—	β Cœli Scal.	39 50·5	40 25·5	40 59·5	41 34	42 9	2 40 59·7	1 8 58·02	0 26 31·39	3 49 57·72	3 7 31·09
29	No Stars ob	served; con	stant rain	throughout	the night,	until day-	light, and then	the weather	became again	fine, and sky	clear.
30	No Stars ob	served; sky	densely ov	ercast with	dark heavy	clouds until	near day-light,	when they gra	dually cleared	away.	
Oct. 1	γ Hydri...	40 45	42 28·5	44 11·5	45 56·5	47 43	1 44 12·9		0 25 5·17		2 9 17·07
A.M.	γ Reticuli.	50 22·5	51 22	52 20·5	53 20·5	54 21·5	1 52 21·4		0 25 5·02		2 17 26·42
—	41 Eridani	4 0·5	4 33·5	5 6	5 39·5	6 13	2 5 6·5		0 25 4·75		2 30 11·25
—	43 „	10 10·5	10 43·5	11 16·5	11 50	12 23·5	2 11 16·8		0 25 4·62		2 36 21·42
—	υ^2 „	21 28	21 59·5	22 31·5	23 3·5	23 35·5	2 22 31·6		0 25 4·4		2 47 36
—	54 „	25 34	26 3	26 32	27 1	27 31	2 26 32·2		0 25 4·32		2 51 36·52
—	β Cœli Scal.	28 29·5	29 4	29 38	30 12·8	30 48	2 29 38·46		0 25 4·26		2 54 42·72
	Note.—In strument other Sta	consequenc could not rs, by the	e of the me be adjusted passage of	ridian mark thereto, an high and	lamp being d therefore low Stars,	obscured by these obser before the	the growth of a vations must be rate of the Clock	young tree sinc reduced to the can be ascer	e the last obser meridian, or to tained.	vations were t the same azim	aken, the In- uth with the

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Trinidad.

1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with SHELTON.	SHELTON at Transit.	Difference of Clocks.	GRAHAM at Transit.
		m s	m s	m s	m s	m s	h m s	h m s	h m s	h m s	h m s
Nov. 10	⊙'s 1st L.	.....	.....	11 14	11 41·2	12 10					
Noon.	⊙'s 2d L	12 30	12 59·5	13 27·5	13 56·5	14 25·5	11 12 20·25	0 23 51·93	11 36 12·18	0 4 37·83	11 40 50·01
—	η Eridani .	56 25·5	56 54	57 21	57 49	58 17	10 57 21·3	0 22 56·41	11 20 17·71	0 5 32·97	11 25 50·68
—	α Ceti	1 41	2 9	2 35·5	3 3·5	3 31·5	11 2 36·1	0 22 55·93	11 25 32·08	0 5 33·41	11 31 5·49
—	12 Eridani	13 1·5	13 32·5	14 4	14 36	15 7·5	11 14 4·3	0 22 55·07	11 36 59·37	0 5 34·32	11 42 33·69
—	16 „	20 9·5	20 39·2	21 8·5	21 38·5	22 8·5	11 21 8·84	0 22 54·51	11 44 3·35	0 5 34·86	11 49 38·21
—	δ Tauri ...	23 53	24 21	24 48	25 16·5	25 44·5	11 24 48·6	0 22 54·21	11 47 42·81	0 5 35·15	11 53 17·96
—	17 Eridani	30 24·5	30 52	31 19·5	31 47	32 15	11 31 19·6	0 22 53·69	11 54 13·29	0 5 35·67	11 59 48·96
—	ε „	33 8	33 36	34 3·5	34 31·5	35 0	11 34 3·8	0 22 53·47	11 56 57·27	0 5 35·88	12 2 33·15
—	δ „	43 17·5	43 45	44 13	44 41	45 9·5	11 44 13·2	0 22 52·67	12 7 5·87	0 5 36·7	12 12 42·57
—	π „	46 17	46 44·5	47 12·5	47 40·8	48 9	11 47 12·76	0 22 52·43	12 10 5·19	0 5 36·94	12 15 42·13
—	β Reticuli .	49 11	50 16	51 21	52 27	53 32·5	11 51 21·5	0 22 52·1	12 14 13·6	0 5 37·27	12 19 50·87
	⊙ obscured, rainy weather throughout the forenoon.										
11	α Ceti	.....	.....	.....	59 14·5	59 42·5	10 58 47·52	0 21 2·81	11 19 50·33	0 7 25·82	11 27 16·15
—	12 Eridani	9 12	9 44	10 15	10 46·5	11 19	11 10 15·3	0 21 2·01	11 31 17·31	0 7 26·72	11 38 44·03
—	16 „	16 20·5	16 50	17 19	17 49·5	18 19·5	11 17 19·7	0 21 1·36	11 38 21·06	0 7 27·27	11 45 48·33
—	δ Tauri...	20 4·5	20 32	20 59·5	21 27·5	21 56	11 20 59·9	0 21 1·07	11 42 0·97	0 7 27·55	11 49 28·52
—	17 Eridani	26 35·5	27 3·5	27 30·5	27 58	28 26·5	11 27 30·8	0 21 0·58	11 48 31·38	0 7 28·06	11 55 59·44
—	ε „	29 19·5	29 47	30 15	30 43	31 10·5	11 30 15	0 21 0·35	11 51 15·35	0 7 28·29	11 58 43·64
—	δ „	39 28·5	39 56·5	40 24	40 52	41 20·5	11 40 24·3	0 20 59·56	12 1 23·86	0 7 29·08	12 8 52·94
—	π „	42 28	42 56	43 24	43 52	44 21	11 43 24·2	0 20 59·33	12 4 23·53	0 7 29·31	12 11 52·84
—	β Reticuli .	45 22	46 27	47 31·5	48 37·8	49 44·5	11 47 32·56	0 20 59·01	12 8 31·57	0 7 29·63	12 16 1·2
12	⊙'s 1st L.	.....	.....	.....	12 8·5	12 37·7					
	⊙'s 2d L.	12 58	13 27	13 55·5	14 24·5	14 54	11 12 47·71	0 20 4·91	11 32 52·62	0 8 23·2	11 41 15·82
P.M.	η Eridani .	48 48	49 16	49 43·5	50 11·5	50 40	10 49 43·8	0 19 10·21	11 8 54·01	0 9 17·43	11 18 11·44
—	α Ceti	54 3·5	54 31	54 58	55 26	55 54	10 54 58·5	0 19 9·79	11 14 8·29	0 9 17·84	12 23 66·13
—	12 Eridani	5 23·5	5 55·5	6 27	6 58·5	7 30·6	11 6 27·02	0 19 8·88	11 25 35·9	0 9 18·74	11 34 54·64
—	16 „	12 31·5	13 1·5	13 31	14 0·5	14 31	11 13 31·10	0 19 8·30	11 32 39·4	0 9 19·29	11 41 58·69

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Shelton.	Shelton at Transit.	Difference of Clocks.	Graham at Transit.
		m s	m s	m s	m s	m s	h m s	h m s	h m s	h m s	h m s
Nov. 12	δ Tauri . . .	16 15	16 43	17 11	17 38·5	18 6·5	11 17 10·8	0 19 7·99	11 36 18·79	0 9 19·58	11 45 38·37
P.M.	17 Eridani	22 47	23 14·5	23 42	24 9·5	24 37	11 23 42	0 19 7·49	11 42 49·49	0 9 20·09	11 52 9·58
—	ε „ .	25 30·5	25 58	26 26	26 54	27 22·5	11 26 26·2	0 19 7·27	11 45 33·47	0 9 20·3	11 54 53·77
—	δ „ .	35 40	36 7·5	36 35·5	37 3	37 32	11 36 35·5	0 19 6·46	11 55 41·96	0 9 21·1	12 5 3·06
—	π „ .	38 39·1	39 7·6	39 35·2	40 3·5	40 31·5	11 39 35·38	0 19 6·3	11 58 41·68	0 9 21·33	12 8 3·01
—	β Reticuli .	. . . . .	42 39	43 44·5	44 50·5	45 58	11 43 44·69	0 19 5·97	12 2 50·66	0 9 21·66	12 12 12·32
13	⊙'s 1st L.	. . . . .	11 26	11 54·5	12 23·5	12 53	11 13 2·93	0 18 11·67	11 31 14·6	0 10 15·27	11 41 29·87
	⊙'s 2d L.	13 13	13 42·2	14 11	14 40	15 9·5					
P.M.	α Ceti	50 14·5	50 42	51 9	51 37	52 5	10 51 9·5	0 17 16·74	11 8 26·24	0 11 9·44	11 19 35·68
—	12 Eridani.	1 34·5	2 6·2	2 37·5	3 9·5	3 41·8	11 2 37·9	0 17 15·88	11 19 53·78	0 11 10·35	11 31 4·13
—	16 „ .	8 43	9 12·5	9 42	10 11·8	10 42	11 9 42·26	0 17 15·25	11 26 57·51	0 11 10·89	11 38 8·4
—	δ Tauri . . .	12 27	12 54·5	13 22	13 49·5	14 18·5	11 13 22·3	0 17 14·94	11 30 37·24	0 11 11·25	11 41 48·49
—	17 Eridani.	18 58	19 25·5	19 53	20 20·5	20 48·5	11 19 53·1	0 17 14·42	11 37 7·52	0 11 11·67	11 48 19·19
—	ε „ .	21 41·5	22 9·5	22 37	23 5	23 33·5	11 22 37·3	0 17 14·19	11 39 51·49	0 11 11·88	11 51 3·37
—	δ „ .	31 51	32 18·5	32 46·5	33 14·5	33 43	11 32 46·7	0 17 13·37	11 50 0·07	0 11 12·68	12 1 12·75
—	π „ .	34 50	35 18·5	35 46	36 14·5	36 43	11 35 46·4	0 17 13·13	11 52 59·53	0 11 12·91	12 4 12·44
—	β Reticuli .	37 43·5	38 49	39 53·5	41 0·5	42 7·5	11 39 54·8	0 17 12·8	11 57 7·6	0 11 13·23	12 8 20·83
14	⊙'s 2d L.	13 30	13 58·5	14 26·7	14 56	15 26	11 13 19·14	0 16 18·34	11 29 37·48	0 12 7·07	11 41 44·55
P.M.	α Ceti	. . . . .	. . . . .	. . . . .	47 48	48 16	10 47 21·02	0 15 23·76	11 2 44·78	0 13 0·82	11 15 45·6
—	12 Eridani.	57 45·2	58 17	58 48·5	59 20	59 52·2	10 58 48·58	0 15 22·84	11 14 11·42	0 13 1·63	11 27 13·05
—	16 „ .	4 53·5	5 23	5 52·5	6 22·5	6 52·5	11 5 52·8	0 15 22·28	11 21 15·08	0 13 2·26	11 34 17·34
—	δ Tauri . . .	8 38	9 5·5	9 32·5	10 0·7	10 28·8	11 9 33·1	0 15 21·98	11 24 55·08	0 13 2·53	11 37 57·61
—	17 Eridani.	15 9	15 36·5	16 3·7	16 31·5	16 59·5	11 16 4·04	0 15 21·46	11 31 25·5	0 13 3·05	11 44 28·55
—	ε „ .	17 52·2	18 20·5	18 48	19 16	19 44	11 18 48·14	0 15 21·24	11 34 9·38	0 13 3·26	11 47 12·64
—	δ „ .	28 2	28 30	28 57	29 25	29 54	11 28 57·6	0 15 20·42	11 44 18·02	0 13 4·05	11 57 22·07
—	π „ .	31 1	31 29·5	31 57	32 25·5	32 54·5	11 31 57·5	0 15 20·18	11 47 17·68	0 13 4·28	12 0 21·96
—	β Reticuli .	33 54·5	35 0·5	36 5	37 11	38 17·8	11 36 5·76	0 15 19·85	11 51 25·61	0 13 4·6	12 4 30·21
15	⊙'s 1st L.	11 30	11 59	12 27·5	12 57	13 26	11 13 36·3	0 14 25·27	11 28 1·57	0 13 58·46	11 42 0·03
	⊙'s 2d L.	13 47	14 15·5	14 44·5	15 13·5	15 43					
P.M.	No Stars observed this evening, the sky being densely clouded throughout the greater part of the night.										

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16	⊙'s 1st L.	11 48·5	12 16·5	12 45·2	13 14·5	13 43·8	11 13 54·1	0 12 32·33	11 26 26·43	0 15 49·65	11 42 16·08
	⊙'s 2d L.	14 4·5	14 33·5	15 2·5	15 31	16 1					
P.M.	η Eridani .	33 32·5	34 0	34 28	34 55·5	35 24	10 34 28	0 11 38·79	10 46 6·79	0 16 42·25	11 2 49·04
—	α Ceti	38 48·7	39 16	39 42·5	40 10	40 38	10 39 43·04	0 11 38·39	10 51 21·43	0 16 42·66	11 8 4·09
—	12 Eridani.	50 7·5	50 39	51 10	51 42	52 13·5	10 51 10·4	0 11 37·48	11 2 47·88	0 16 43·55	11 19 31·43
—	16 „ .	57 15·5	57 45	58 14·5	58 44·5	59 15	10 58 14·9	0 11 36·91	11 9 51·81	0 16 44·1	11 26 35·91
—	δ Tauri ...	0 59·6	1 27·5	1 55·5	2 23	2 51	11 1 55·32	0 11 36·62	11 13 31·94	0 16 44·37	11 30 16·31
—	17 Eridani.	7 31	7 58·5	8 25·5	8 53·5	9 21·2	11 8 25·94	0 11 36·1	11 20 2·04	0 16 44·87	11 36 46·91
—	ε „ .	10 14·5	10 42·2	11 9·5	11 38	12 6	11 11 10·04	0 11 35·88	11 22 45·92	0 16 45·09	11 39 31·01
—	δ „ .	20 24	20 51·5	21 19	21 47·5	22 16	11 21 19·6	0 11 35·08	11 32 54·68	0 16 45·87	11 49 40·55
—	π „ .	23 23·5	23 51·5	24 19	24 47·5	25 16	11 24 19·5	0 11 34·84	11 35 54·34	0 16 46·1	11 52 40·44
—	β Reticuli .	26 16·5	27 22	28 27	29 33	30 40·5	11 28 27·8	0 11 34·51	11 40 2·31	0 16 46·42	11 56 48·73
17	⊙'s 1st L.	12 6	12 35	13 3·5	13 33	14 2·5	11 14 12·8	0 10 39·28	11 24 52·08	0 17 40·71	11 42 32·79
	⊙'s 2d L.	14 23·5	14 52·5	15 21	15 50·5	16 20·5					
P.M.	η Eridani .	29 43·8	30 11·4	30 38·5	31 6·5	31 35·2	10 30 39·08	0 9 46·32	10 40 25·4	0 18 32·56	10 58 57·96
—	α Ceti	34 59	35 26·5	35 53·5	36 21	36 48·8	10 35 53·76	0 9 45·9	10 45 39·66	0 18 32·97	11 4 12·63
—	12 Eridani.	46 18·5	46 50	47 21	47 53	48 25·5	10 47 21·6	0 9 44·99	10 57 6·59	0 18 33·85	11 15 40·44
—	16 „ .	53 27	53 56·5	54 25·5	54 55·5	55 26	10 54 26·1	0 9 44·43	11 4 10·53	0 18 34·39	11 22 44·92
—	δ Tauri ...	57 11	57 38·5	58 6	58 34	59 2·5	10 58 6·4	0 9 44·13	11 7 50·53	0 18 34·68	11 26 25·21
—	17 Eridani.	3 41·5	4 9·5	4 36·5	5 4·5	5 32·5	11 4 36·9	0 9 43·62	11 14 20·52	0 18 35·18	11 32 55·7
—	ε „ .	6 25·5	6 53·5	7 21	7 49	8 17·5	11 7 21·3	0 9 43·38	11 17 4·68	0 18 35·39	11 35 40·07
—	δ „ .	16 35	17 2·7	17 30	17 58	18 27	11 17 30·54	0 9 42·59	11 27 13·13	0 18 36·17	11 45 49·3
—	π „ .	19 34	20 2	20 30	20 58·2	21 27	11 20 30·24	0 9 42·36	11 30 12·6	0 18 36·4	11 48 49
—	β Reticuli .	22 27·8	23 33	24 37·5	25 44	26 51	11 24 38·66	0 9 42·03	11 34 20·69	0 18 36·72	11 52 57·41
18	⊙'s 1st L.	12 25·2	12 54·2	13 23	13 52·5	14 22	11 14 32·1	0 8 46·45	11 23 18·55	0 19 31·03	11 42 49·58
	⊙'s 2d L.	14 42·5	15 11·2	15 40·5	16 10	16 39·6					
P.M.	12 Eridani.	43 30	43 1·5	43 32·5	44 4	44 36·5	10 43 32·9	0 7 52·32	10 51 25·22	0 20 23·71	11 11 48·93
—	16 „ .	49 38	50 7·5	50 37	51 7	51 37	10 50 37·3	0 7 51·9	10 58 29·2	0 20 24·27	11 18 53·47
—	δ Tauri ...	53 22	53 50	54 17·5	54 45	55 13	10 54 17·5	0 7 51·49	11 2 8·99	0 20 24·55	11 22 33·54
—	17 Eridani.	59 53	0 20·5	0 48	1 15·5	1 43·5	11 0 48·1	0 7 50·98	11 8 39·08	0 20 25·05	11 29 4·13
—	ε „ .	2 36·5	3 4·5	3 32	4 0	4 28	11 3 32·2	0 7 50·76	11 11 22·96	0 20 25·26	11 31 48·22
—	δ „ .	12 46	13 14	13 41·5	14 9·5	14 38	11 13 41·8	0 7 49·95	11 21 31·75	0 20 26·01	11 41 57·76

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Shelton.	Shelton at Transit.	Difference of Clocks.	Graham at Transit.
		m s	m s	m s	m s	m s	h m s	h m s	h m s	h m s	h m s
Nov. 18	π Eridani .	15 45·5	16 13·5	16 41	17 9·5	17 38·5	11 16 41·6	0 7 49·71	11 24 31·31	0 20 26·24	11 44 57·55
P.M.	β Reticuli .	18 39·5	19 44·5	20 49·5	21 55·5	23 2	11 20 50·2	0 7 49·37	11 28 39·57	0 20 26·56	11 49 6·13
19	⊙'s 1st L.	12 46	13 14·5	13 44	14 13	14 42 5					
	⊙'s 2d L.	15 3·2	15 32·5	16 1·4	16 30·5	17 0·5	11 14 52·81	0 6 53·46	11 21 46·27	0 21 21·08	11 43 7·35
P.M.	η Eridani .	22 6	22 33·5	23 1	23 29·2	23 57·5	10 23 1 44	0 6 1·1	10 29 2·54	0 22 11·97	10 51 14·51
—	α Ceti	27 21·4	.....	28 16	28 43·5	29 11·5	10 28 16·35	0 6 0·69	10 34 17·04	0 22 12·37	10 56 29·41
—	12 Eridani.	38 41	39 12·5	39 43·5	40 15·5	40 48	10 39 44·1	0 5 59·79	10 45 43·89	0 22 13·24	11 7 57·13
—	16 „ .	45 49	46 19	46 48·5	47 18·5	47 48·5	10 46 48·7	0 5 59·23	10 52 47·93	0 22 13·78	11 15 1·71
—	δ Tauri ...	49 33·5	50 1	50 28·5	50 56·5	51 25	10 50 28·9	0 5 58·87	10 56 27·77	0 22 14·06	11 18 41·83
—	17 Eridani.	56 4·5	56 32	56 59·5	57 27	57 55·5	10 56 59·7	0 5 58·36	11 2 58·06	0 22 14·56	11 25 12·62
—	ε „ .	58 48	59 16	59 43·5	60 11·5	60 40	10 59 43·8	0 5 58·14	11 5 41·94	0 22 14·76	11 27 56·7
—	δ „ .	8 57·5	9 25	9 53	10 21	10 49·5	11 9 53·2	0 5 57 34	11 15 50·54	0 22 15·53	11 38 6·07
—	π „ .	11 56·5	12 24·5	12 52·5	13 21	13 49	11 12 52·7	0 5 57·11	11 18 49·81	0 22 15·76	11 41 5·57
—	β Reticuli .	14 50·5	15 55·5	17 0·5	18 6·2	19 14	11 17 1·34	0 5 56·79	11 22 58·13	0 22 16·09	11 45 14·22
20	Sun obscured at noon.	The Stars this evening, previous to 17 Eridani, could not be observed in consequence of clouds.									
—	17 Eridani.	52 16	52 43·5	53 10·5	53 38·5	54 6·5	10 53 11	0 4 5·72	10 57 16·72	0 24 3·82	11 21 20·54
—	ε „ .	54 59·5	55 27	55 55	56 23	56 51·5	10 55 55·2	0 4 5·5	11 0 0·7	0 24 4·02	11 24 4·72
—	δ „ .	5 8·7	5 37	6 4	6 32·5	7 0·5	11 6 4·54	0 4 4·7	11 10 9·24	0 24 4·79	11 34 14·03
—	π „ .	8 8·5	8 36·5	9 4	9 32·5	10 1·5	11 9 4·6	0 4 4·46	11 13 9·06	0 24 5·03	11 37 14·09
21	Sun obscured at noon; heavy rainy weather.										
P.M.	η Eridani .	.....	14 56·5	.....	15 52	.....	10 15 24·44	0 2 15·7	10 17 40·14	0 25 50·38	10 43 30·52
—	α Ceti	.....	20 12	20 38·5	21 6	.....	10 20 38·83	0 2 15·39	10 22 54·22	0 25 50·78	10 48 45
—	12 Eridani.	.....	31 35	32 6	.....	33 10	10 32 6·03	0 2 14·49	10 34 20·52	0 25 51·64	11 0 12·16
—	16 „ .	38 12	38 41·5	39 10·5	39 40·5	40 11	10 39 11·1	0 2 13·93	10 41 25·03	0 25 52·18	11 7 17·21
—	δ Tauri ...	41 56	42 23·5	42 50·8	43 18·5	43 47	10 42 51·16	0 2 13·64	10 45 4·8	0 25 52·46	11 10 57·26
—	17 Eridani.	48 27	48 54·5	49 21·7	49 49	50 17·5	10 49 21·94	0 2 13·09	10 51 35·03	0 25 52·95	11 17 27·98
—	ε „ .	51 10·5	51 38·5	52 5·6	52 34	53 1·5	10 52 6·02	0 2 12·9	10 54 18·92	0 25 53·16	11 20 12·08
—	δ „ .	1 20	1 47·8	2 15·5	2 43·5	3 12	11 2 15·76	0 2 12·11	11 4 27·87	0 25 53·94	11 30 21·81
—	π „ .	4 19·2	4 47·5	5 15·2	5 43·5	6 12·5	11 5 15·58	0 2 11·86	11 7 27·44	0 25 54·17	11 33 21·61

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1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
Dec. 28	54 Eridani	51 1·8	51 30·6	10 — —	52 29·4	52 59·5	10 51 59·74	0 55 50·41	9 56 9·33
P.M.	μ „	55 3	55 30·8	10 55 58	56 26	56 54	10 55 58·36	0 55 50·69	10 0 7·67
—	63 „	9 48	10 16	11 10 43·5	11 11	11 39	11 10 43·5	0 55 51·8	10 14 51·7
—	β „	17 29	17 56·5	11 18 24	18 52	19 20	11 18 24·3	0 55 52·47	10 22 31·83
—	Rigel	24 20·5	24 48	11 25 15·5	25 43	26 11·5	11 25 15·7	0 55 53·11	10 29 22·59
—	λ Leporis	29 41·5	30 9·5	11 30 37·5	31 6	31 34·5	11 30 37·8	0 55 53·41	10 34 44·39
—	η Orionis	33 52·6	34 20	11 34 47·5	35 15	.....	11 34 47·37	0 55 53·73	10 38 53·64
—	β Leporis	38 51	39 20·5	11 39 50	40 19	40 48·5	11 39 49·8	0 55 54·11	10 43 55·69
—	ϵ Orionis	45 30·2	45 58	11 46 25·3	46 52	47 20·5	11 46 25·2	0 55 54·64	10 50 30·56
—	ζ „	50 5·5	50 33	11 51 0	51 27·5	51 55·5	11 51 0·3	0 55 54·99	10 55 5·31
29	⊙'s 1st Limb	47 30·5	48 0·5	0 48 29·7	49 0	49 30·2	0 49 41·21	0 56 54·84	11 52 46·37
	⊙'s 2d Limb	49 52·2	50 22	0 50 52	51 22	51 53			
P.M.	54 Eridani	47 13·5	47 43	10 48 12	48 41	49 11·5	10 48 12·2	0 57 40·67	9 50 31·53
—	μ „	51 15·5	51 43	10 52 10	52 37·2	53 6	10 52 10·34	0 57 40·98	9 54 29·36
—	63 „	6 0·5	6 28	11 6 55·5	7 24	7 52·5	11 6 56·1	0 57 42·11	10 9 13·99
—	β „	13 41	14 8·7	11 14 36	15 4	15 31·6	11 14 36·26	0 57 42·74	10 16 53·52
—	Rigel	20 32·5	21 0·5	11 21 28	21 56	22 24·2	11 21 28·24	0 57 43·27	10 23 44·97
—	λ Leporis	25 53·5	26 22	11 26 49·5	27 18·2	27 47	11 26 50·04	0 57 43·69	10 29 6·35
—	η Orionis	30 4·5	30 32·5	11 31 0	31 27	31 55·5	11 30 59·9	0 57 44·01	10 33 15·89
—	β Leporis	35 4	35 33	11 36 2	36 31·5	37 2	11 36 2·5	0 57 44·51	10 38 17·99
—	ϵ Orionis	41 42·5	42 10	11 42 37	43 4·5	43 33	11 42 37·4	0 57 44·92	10 44 52·48
—	ζ „	46 17·5	46 45	11 47 12·5	47 39·6	48 7·5	11 47 12·42	0 57 45·28	10 49 27·14
30	⊙'s 1st Limb	48 8·8	48 38·5	12 49 8	49 38·5	50 9	12 50 19·53	0 58 45·94	11 51 33·59
	⊙'s 2d Limb	50 30·5	51 0·5	12 51 30	52 0·5	52 31			
P.M.	54 Eridani	43 27	43 56	10 44 25	44 54·5	45 25	10 44 25·5	0 59 31·71	9 44 53·79
—	μ „	47 28·5	47 56	10 48 23·2	48 51	49 19	10 48 23·54	0 59 32·02	9 48 51·52
—	63 „	2 13·8	2 41	11 3 8·5	3 37	4 5·5	11 3 9·16	0 59 33·17	10 3 35·99

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Appendix. Table II.—Porto Bello.

1830.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
Dec. 30	β Eridani.....	9 54	10 22	11 10 49	11 17	11 44·5	11 10 49·30	0 59 33·76	10 11 15·54
P.M.	Rigel.....	16 46	17 13·5	11 17 41	18 9	18 37	11 17 41·3	0 59 34·3	10 18 7
—	λ Leporis.....	22 7	22 35	11 23 3	22 31·5	24 0	11 23 3·3	0 59 34·71	10 23 28·59
—	η Orionis.....	26 18	26 45·5	11 27 13	27 40·5	28 8·5	11 27 13·1	0 59 35·04	10 27 38·06
—	β Leporis.....	31 16·5	31 46	11 32 15	32 44·5	33 15	11 32 15·4	0 59 35·42	10 32 39·98
—	ε Orionis.....	37 56	38 23·5	11 38 50·5	39 18	39 46	11 38 50·8	0 59 35·93	10 39 14·87
—	β Doradus....	41 34	42 32·6	11 43 32	44 31·5	45 33	11 43 32·62	0 59 36·3	10 43 56·32
—	Canopus.....	29 53·2	30 38·5	12 31 23·5	32 8·5	32 55	12 31 23 74	0 59 40·01	11 31 43·73
31	⊙'s 1st Limb	48 47	49 16·5	12 49 46·2	50 16·5	50 46·7	12 50 57·46	1 0 37·22	11 50 20·24
	⊙'s 2d Limb	51 8·5	51 38·2	12 52 8	52 38	53 9			
P.M.	63 Eridani....	58 26·5	58 54·5	10 59 22	59 50	60 18·7	10 59 22·34	1 1 23·91	9 57 58·43
—	β „	6 7·5	6 35	11 7 2·5	7 30·5	.....	11 7 2·51	1 1 24·52	10 5 37·99
—	Rigel.....	12 58·5	13 26	11 13 54	14 22	14 50	11 13 54·1	1 1 25·07	10 12 29·03
—	λ Leporis.....	18 19·7	18 48	11 19 16	19 44·5	20 13	11 19 16·24	1 1 25·47	10 17 50·77
—	η Orionis.....	22 31	22 58·5	11 23 26	23 53·5	24 21·5	11 23 26·1	1 1 25·79	10 22 0·31
—	β Leporis.....	27 30	27 59·2	11 28 28·2	28 58	.....	11 28 28·39	1 1 26·17	10 27 2·22
—	ε Orionis.....	.....	.....	11 35 3·5	35 31	35 59·2	11 35 3·51	1 1 26·56	10 33 36·95
—	ζ „	38 44	39 11·5	11 39 38·5	40 6	40 34	11 39 38·8	1 1 27·06	10 38 11·74
—	Canopus.....	26 6·5	26 51	12 27 36	28 21	29 7·5	12 27 36·4	1 1 30·77	11 26 5·63
1831	⊙'s 1st Limb	.....	49 54	12 50 23·5	50 53·5	51 24	12 51 34·69	1 2 28·06	11 49 6·63
January 1	⊙'s 2d Limb	.....	.....	12 1 10·8	.....	53 45·7			
P.M.	No Stars observed this evening, the sky being overcast with heavy rain clouds.								
2 Noon	The Sun obscured; heavy rains during the morning and forenoon; afternoon showers, and occasionally clear parts of sky.								
P.M.	63 Eridani....	50 51·5	51 19·3	10 51 47	52 15·2	52 43·5	10 51 47·3	1 5 4·35	9 46 42·95
—	β „	.....	59 0	10 59 27	59 55	0 23·5	10 59 27·32	1 5 5·03	9 54 22·29
—	Rigel.....	.....	.....	11 — —	6 47	7 15·5	11 6 19·27	1 5 5·53	10 1 13·74
—	λ Leporis.....	.....	11 13	11 — —	.....	12 38	11 11 40·86	1 5 5·87	10 6 34·99
—	ε Orionis.....	26 34	27 1·5	11 27 28·5	.....	28 24	11 27 28·56	1 5 7·07	10 22 21·49
—	ζ „	31 8·9	31 36·7	11 32 3·5	.....	.....	11 32 3·65	1 5 7·42	10 26 56·23
—	Canopus.....	.....	19 16	12 20 0·5	20 46·5	.....	12 20 1	1 5 11·08	11 14 49·92

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3	The Sun obscured during the time of passing the meridian.								
P.M.	μ Eridani.....	.....	32 46·5	10 33 13	33 41	34 9	10 33 13·37	1 6 52·79	9 26 20·58
—	63 „	47 3·5	47 31	10 47 58·7	.....	48 55·5	10 47 58·84	1 6 53·97	9 41 4·87
—	Rigel.....	1 35·5	2 4	11 2 31	2 59	3 27	11 2 31·3	1 6 55·08	9 55 36·22
—	λ Leporis.....	6 57	7 25	11 7 53	8 21·5	8 50·4	11 7 53·38	1 6 55·49	10 0 57·89
—	η Orionis.....	11 8	11 36	11 12 3	12 30·5	12 58·5	11 12 2·72	1 6 55·81	10 5 6·91
—	β Leporis.....	16 6·8	16 36	11 17 5	17 35	18 4·8	11 17 5·52	1 6 56·2	10 10 9·32
—	ε Orionis	22 45·5	.....	11 — —	.....	.....	11 23 40·23	1 6 56·69	10 16 43·54
—	ζ „	27 20·5	27 48	11 28 15·5	28 43·2	29 11	11 28 15·64	1 6 57·06	10 21 18·58
	After the passage of ζ Orionis, rain commenced falling in heavy torrents for some time.								
4	The Sun obscured at noon; heavy rain, and dark cloudy weather.								
P.M.	63 Eridani....	.....	.....	10 — —	44 39·5	45 8	10 44 11·50	1 8 43·96	9 35 27·54
—	β „	.....	.....	10 — —	.....	52 47	10 51 51·16	1 8 44·55	9 43 6·61
—	Rigel.....	57 48	58 16	10 58 43·5	59 11·3	59 39·5	10 58 43·66	1 8 45·08	9 49 58·58
—	ε Orionis	18 58	.....	11 — —	.....	20 48·5	11 19 52·80	1 8 46·8	10 11 6
—	Canopus.....	10 56	11 40·5	12 12 25·5	13 10·6	13 57	12 12 25·92	1 8 50·74	11 3 35·18
5	At noon, the Sun obscured; passing clouds, with occasional showers of rain throughout the day.								
—	μ Eridani.....	.....	.....	10 25 37	26 5·5	26 34	10 25 37·76	1 10 33·04	9 15 4·72
—	63 „	.....	.....	10 — —	.....	41 20	10 40 23·46	1 10 34·15	9 29 49·31
—	β „	47 9	47 36·5	10 48 3·5	48 31·5	49 0	10 48 4·1	1 10 34·74	9 37 29·36
—	Rigel.....	54 0·5	54 28	10 54 55·5	55 23·5	55 51·5	10 54 55·8	1 10 35·25	9 44 20·55
—	λ Leporis.....	59 21·5	59 49·5	11 0 17·5	0 46	1 14·8	11 0 17·86	1 10 35·78	9 49 42·08
—	η Orionis	3 32·5	4 0·5	11 4 27·5	4 55	5 23·5	11 4 27·8	1 10 35·99	9 53 51·81
—	β Leporis.....	8 31	9 0·5	11 9 29·7	9 59	10 28·5	11 9 29·74	1 10 36·36	9 58 53·38
—	ε Orionis	15 10·2	15 38	11 16 5	16 32·5	17 0·5	11 16 5·24	1 10 36·86	10 5 28·38
—	ζ „	19 45·5	20 12·5	11 20 39·5	21 7·5	21 35·5	11 20 40·1	1 10 37·2	10 10 2·9
—	Canopus.....	.....	7 52·5	12 8 37·5	9 23	10 9·2	12 8 37·67	1 10 40·89	10 57 56·78
6	⊙'s 1st Limb	52 22·5	.....	12 — —	.....	.....	12 54 32·57	1 11 39·4	11 42 53·17
	⊙'s 2d Limb	.....	55 13·5	12 55 43	56 12·5	56 43			
P.M.	54 Eridani....	16 53·5	17 22·5	10 17 52	18 21	18 51	10 17 52	1 12 22·58	9 5 29·42
—	μ „	20 55	21 22·5	10 21 50	22 17·5	22 45·5	10 21 50·1	1 12 22·87	9 9 27·23
—	63 „	35 40	36 8	10 36 35·5	37 4	37 32·2	10 36 35·94	1 12 24·02	9 24 11·92

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Appendix. *Table II.—Porto Bello.*

1831.	Stars, &c.	1st.	2nd.	3rd.	4th.	5th.	Mean by Chron.	Comparison with Clock.	Clock at Transit.
		m s	m s	h m s	m s	m s	h m s	h m s	h m s
January 6	β Eridani.....	43 21	43 48·8	10 44 16	.....	.....	10 44 15·99	1 12 24·62	9 31 51·37
P.M.	Rigel	50 12·5	50 40	10 51 7·5	51 35·5	52 4	10 51 7·9	1 12 25·13	9 38 42·77
—	λ Leporis.....	55 33·5	.....	10 56 29·5	.....	.....	10 56 29·6	1 12 25·54	9 44 4·06
—	β "	.....	.....	11 — —	6 11·5	.....	11 5 42·09	1 12 26·18	9 53 15·91
—	ε Orionis	11 22·8	11 50	11 12 17	12 44·8	13 12·5	11 12 17·42	1 12 26·76	9 59 50·66
—	Canopus.....	3 20	4 5·5	12 4 49·5	5 35	6 21·5	12 4 50·3	1 12 30·79	10 52 19·51
7	⊙'s 1st Limb	52 57	53 27	12 53 56	54 26	54 56·5			
	⊙'s 2d Limb	55 18·5	55 48	12 — —	.....	.....	12 55 7·05	1 13 29·82	11 41 37·23

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TABLE III.—TRANSITS REDUCED TO PENDULUM CLOCK TIME.

Monte Video.

1828.	Mean Noon by Sun.	Antares.	α Herculis.	α Ophiuchi.	β Ophiuchi.	γ Ophiuchi.	α Lyræ.	β Lyræ.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
August 26	0 0 6·96							
27	11 59 19·46	5 53 41·28						
30	11 56 57·04	39 31·32	6 27 17·47	6 47 21·88	6 55 22·04	6 59 38·67	7 51 19·58	8 3 53·48
31	11 56 7·44	34 46·84	22 32·56	42 37·73	50 38·09	54 55·01	46 35·04	7 59 9·28
September 1	11 55 20·52	.....	17 49·39	37 54·11	45 54·39	50 11·03	41 51·92	54 26·07
3	11 53 45·22	.....	8 23·54	28 28·63	36 28·69	40 45·44	32 24·95	
4	.....	.....	3 40·34	23 45·35	31 45·29	36 2·01	27 42·50	40 16·82
5	.....	.....	5 58 56·27	19 1·81	27 1·95	31 19·21		
6	.....	.....	51 15·03	14 20·36	.....	.....	18 19·34	30 52·61
7	.....	.....	49 33·05	9 37·89	17 37·83	21 54·29	.....	26 9·62

1828.	ζ Sagitt.	ζ Aquilæ.	ϑ Aquilæ.	γ Aquilæ.	α Aquilæ.	β Aquilæ.	α^2 Capric.	α Cygni.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
August 25	.....	8 41 15·19	9 0 30·61	9 21 42·02	9 26 0·15	9 30 27·62	9 52 1·64	
30	8 11 48·59	8 17 37·39	8 36 53·06	8 58 4·23	9 2 21·52	9 6 49·06	9 28 23·59	9 55 22·58
31	7 4·91	12 53·24	32 9·03	53 20·12	8 57 38·08	2 5·29	23 39·74	50 38·53
September 1	2 21	8 10·13	27 25·21	48 36·86	52 54·33	8 57 21·79	18 56·53	45 55·39
2	.....	.....	22 42·79	43 54·23	48 11·57	52 39·04	14 13·73	41 12·71
3	.....	7 58 43·81	17 59·83	.....	43 28·83	.....	9 31·10	
4	.....	54 0·96	13 16·34	34 27·64	38 45·28	43 12·82	4 47·30	31 46·30
5	.....	49 18·26	8 34·13	29 45·18	34 2·98	38 30·52	0 4·77	
6	.....	44 35·38	3 51·31	25 2·56	29 20·20	33 47·91	8 55 22·40	22 21·36
7	.....	39 53·38	.....	20 20·14	24 37·95	29 5·74		

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1828.	Mean Noon by Sun.	Fomalhaut.	2 Ceti.	γ Pegasi.	δ Ceti.	β Ceti.	η Ceti.	ι Ceti.	τ Ceti.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
November 3	0 19 25·09	8 14 56·5	.....	9 31 2·37	9 37 17·58	10 1 31·7			
4	0 20 0·03								
5	0 20 38·7								
6	0 21 14·62								
10	0 23 40·92	7 51 40·6	8 58 18·54	7 46·09	14 1·4	9 38 15·23	10 3 11·11	10 18 38·28	10 39 13·81
11	.....	48 20·77							
12	0 24 53·3	45 1·03	51 40·12	1 7·17	7 21·98	31 36·13	9 56 32·12	11 59·47	32 35·45
13	0 25 30·45	41 41·65	48 20·17	8 57 47·44	4 2·69	28 16·48	53 12·63	8 40·11	
14	.....	38 22·23							
15	.....	35 2·72	41 41·32	51 8·3	8 57 23·7	21 37·36	46 33·45	.....	22 36·75
16	.....	.....	.....	.....	.....	.....	.....	9 58 41·13	19 17·06
17	0 27 55·74	28 23·3	35 3·26						
20	.....	18 24·42							
21	0 30 22·31	15 4·36	.....	.....	.....	9 1 39·3	26 35·78	.....	10 2 38·83
22	0 30 57·53								
23	0 31 33·71	.....	.....	.....	.....	8 54 59·83	19 56·08	35 23·33	9 55 59·35
24	0 32 10·3								
26	0 33 23·05	6 58 27·03	.....	.....	.....	.....	9 9 56·42	9 25 24·35	9 46 0·38
December 1	5 35 25·87								
3	5 40 0·22	.....	.....	.....	.....	1 24 39·56	1 49 37·53	2 5 5·37	2 25 43·45
4	5 42 18·3								
5	5 44 35·44								
6	5 46 53·19								
7	5 49 10·03								
9	5 53 45·53	.....	.....	.....	.....	1 14 45·6	.....	.....	2 15 49·62
10	5 56 2·02								
11	5 58 18·2								
13	6 2 52·4	11 21 22·91	.....	.....	.....	.....	.....	.....	2 9 10·96
14	6 5 9·07								
15	6 7 26·05	.....	.....	.....	.....	.....	.....	.....	2 5 53·12

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1828.	ζ Ceti.	ϑ Ceti.	γ Ceti.	η Eridani.	α Ceti.	12 Eridani.	16 Eridani.	ε Eridani.	ϑ Eridani.	γ Eridani.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
Nov. 10	10 46 7·15									
12	39 28·68									
15	29 29·6									
16	26 10·01									
21	9 31·46	.....	.....	.....	.....	.....	.....	11 51 9·93	.....	0 16 17·12
23	2 52·43	10 50 27·88	10 54 10·95	.....	.....	11 24 28·62	11 31 33·9	44 30·12	11 54 39·63	0 9 37·3
26	9 52 53·07	40 28·96	10 44 12·1	10 57 47·59	11 3 10·22	14 29·5	21 34·95	34 30·84	44 40·26	11 59 37·91
Dec. 1	.....	3 23 33·42	3 27 16·55	3 40 53·13	3 46 9·27	3 57 36·02	4 4 41·96	4 17 38·96	4 27 49·35	4 42 47·93
3	2 32 36·49	.....	.....	.....	.....	54 18·29	4 1 24·04	14 21·07	24 31·46	39 30·32
9	22 42·94	10 21·71	14 5·07	27 41·98	32 58·06	44 24·77	3 51 30·45	4 4 27·7	14 37·74	29 36·5
12	.....	.....	.....	22 43·4	27 59·23	39 26·13	46 32·01	3 59 29·13	9 39·25	24 38·1
13	16 5·17	3 44·03	7 26·99	21 4·22	26 20·01	37 46·97	44 52·55	57 49·67	7 59·88	22 58·62
14	.....	.....	.....	19 24·02	24 40·34	36 7·2	43 12·79	56 10·06	6 20·45	21 18·99
15	.....	.....	.....	17 45·8	23 1·38	34 27·79	41 34·1	54 30·73	4 41	19 39·75

South Shetland.

1829.	Mean Noon by Sun.	Rigel.	α Columbæ.	α Orionis.	Syrius.	Procyon.	α Hydræ.
	h m s	u m s	h m s	h m s	h m s	h m s	h m s
January 17	.....	.....	10 7 0·85	10 19 28·64	11 11 3·95		
18	0 23 5·9						
23	0 29 39·89						
26	0 33 36·72						
28	.....	9 11 6·54	9 38 10·39				
29	0 37 33·34						
February 1	0 41 33·4	9 0 37·65	27 41·42	9 40 9·56	10 31 44·59	11 24 24·04	1 13 2·43
2	0 42 52·73						
3	0 44 11·97						
4	0 45 32·36	8 52 48·27	19 52·2	32 20·37	23 55·63	16 35·17	1 5 13·32
5	0 46 52·08	50 12·67	17 16·01	29 44·2	21 19·84	13 59·64	1 2 36·97
7	0 49 31·9	44 59·54	12 3·17	24 31·9	16 6·85	8 46·07	0 57 24·18
9	10 57 38·26						
10	11 0 19·2						
12	11 5 38·81						
13	11 8 20·66	6 40 35·27	7 7 40·23	7 20 9·91			
17	11 19 4·78						
23	11 35 14·19						
25	11 40 37·54						

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Appendix. Table III.—Cape Horn.

Cape Horn

1829.	Mean Noon by Sun.	α Argus.	Sirius.	ν² Argus.	α Hydræ.	Regulus.	42 μ Hydræ et Crat.	4 ν Hydræ et Crat.	α Hydræ et Crat.	β Hydræ et Crat.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
April 16	.....	.....	.....	.....	7 28 28·24					
19	11 50 42·01	.....	4 37 41·23	6 4 10·55	18 55·73	7 58 54·28	8 17 26·89	8 40 45·54	8 50 59·98	9 2 47·02
21	52 12·14	4 13 54·42	31 19·23	5 57 49·01	12 33·92	.....	11 4·05	34 24·21	44 37·83	8 56 25·36
22	.....	.....	.....	54 38·54	.....	.....	7 53·74	31 12·97	41 27·07	53 14·44
23	53 43·26	.....	.....	.....	.....	46 10·77	4 43·51			
24	54 28·39	4 22·29	.....	.....	7 3 1·17					
25	.....	.....	.....	.....	.....	39 49·49	.....	.....	31 55·48	
26	55 57·85									
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	37 19·36
28	.....	.....	.....	.....	6 50 16·93					
May 1	59 44·48									
3	.....	.....	.....	.....	.....	.....	.....	.....	6 27·96	18 14·94
4	.....	.....	.....	.....	31 12·47	.....	7 29 43·64	7 53 1·68	3 17·05	

1829.	δ Hydræ et Crat.	σ Leonis.	β Virginis.	δ Centauri.	γ Corvi.	η Virginis.	δ Virginis.	ε Virginis.	α Virginis.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
April 19	9 10 18·21	9 18 37·2	9 41 13·3	9 58 58·16	.....	10 10 31·67	.....	.....	11 15 25·43
21	3 56·33	12 15·62	.....	52 36·55	10 0 2·87	.....	10 39 55·1	.....	9 3·79
22	0 45·54	9 4·39	31 40·59	49 25·7	9 56 52·02	10 0 59·02	36 44·26	.....	5 53·22
23	.....	.....	.....	.....	.....	9 57 48·19	33 33·54		
25	8 51 13·36	8 59 32·67	22 8·45	39 53·55	9 47 20·27				
27	.....	.....	15 45·29	33 30·5	40 56·44	45 3·82	20 48·85	10 27 28·24	10 49·57·61
28	.....	.....	.....	.....	.....	.....	.....	24 17·43	
May 1	.....	.....	9 3 3·16	.....	28 13·85	32 20·84			
3	25 46·02	.....	8 56 40·81	.....	21 52·32	25 59·42	.....	8 23·66	
4	.....	.....	53 30·63	.....	18 42·13				

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1829.	Mean Noon by Sun.	Antares.	α Herculis.	α Ophiuchi.	β Ophiuchi.	γ Ophiuchi.	α Lyræ.	β Lyræ.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
August 7	.....	.....	7 9 12·47	.....	.....	.....	8 33 13·39	8 45 47·92
8	11 5 41·7	6 16 31·1	7 4 16·32	7 24 21·38	7 32 21·26	7 36 38·24	28 17·39	46 52·1
9	4 42·85	11 35·48	6 59 20·21	19 24·24	27 24·96	31 41·7	23 20·84	35 55·49
10	.....	6 39·57	.....	.....	.....	.....	18 25·34	31 0·13
11	2 41·36	1 44·1	49 27·97	9 33·86	17 33·57	21 49·82	13 29·75	26 4·01
12	1 42·7							
13	11 0 42	5 51 51·76	39 37·84	6 59 42·01	7 41·59	11 58·77	3 37·71	16 12·59
27	10 46 32·05							
28	10 45 31·39	.....	.....	.....	.....	.....	6 49 29·22	7 2 5·02
29	44 31·32							
September 1	.....	.....	.....	.....	.....	.....	29 42·89	6 42 17·46
2	40 25·91	.....	.....	.....	.....	.....	24 46·95	6 37 20·06
4	38 23·72							

1829.	γ Lyræ.	ζ Aquilæ.	ϑ Aquilæ.	γ Aquilæ.	α Aquilæ.	β Aquilæ.	α^2 Capric.	γ Cygni.	α Cygni.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
August 7	8 54 32·37	8 59 31·34	9 18 47·13	9 39 58·79	9 44 16·21	9 48 43·87	10 10 17·92	10 17 49·62	10 37 16·32
8	49 36·77	54 34·58	.....	35 2·38	39 19·98	43 47·34	5 22·67	12 53·09	32 19·99
9	44 40·11	49 39·42	8 55·35	30 7·1	34 24·16	38 51·76	10 0 26·67	7 57·36	27 23·65
10	39 44·77	44 44·15	.....	.....	29 28·14	.....	9 55 30·41	3 1·47	22 27·85
11	34 49·61	39 48·48							
12									
13	24 57·99	29 56	8 49 11·52	10 22·76	14 40·34	9 19 7·83	40 42·4	9 48 13·27	7 40·08
27	7 15 45·83	7 20 44·97	7 40 0·57	.....	8 5 29·25	8 9 56·93	8 31 30·87	.....	8 58 28·95
28	7 10 49·57	7 15 48·84	7 35 4·25	7 56 15·09	0 32·96	5 0·28	26 35·42	8 34 5·94	53 32·39
29									
September 1	6 51 2·21	6 56 1·74	15 17·6						
2	46 5·28	51 4·47	10 20·22	7 31 30·96	7 35 48·64	7 40 16·09	8 1 50·63	8 9 21·28	8 28 48·28
4	.....	41 10·86							

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Cape of Good Hope (continued).

1829.	Mean Noon by Sun.	γ Pegasi.	Sirius.	Castor.	Procyon.	Pollux.	α Hydræ.	Regulus.	α Aquilæ.	β Aquarii.	α Aquarii.	α Pegasi.	α Androm.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
Oct. 25	.....	.....	11 46 28·12	0 32 27·56	0 35 5·9	0 43 35·66	2 27 43·17						
26	7 26 4·62	5 11 19·58	43 44·08	29 43·43	36 22·37	40 51·92	24 59·31	.....	.....	2 29 44·08	3 4 7·59	4 3 15·66	5 6 27·92
27	27 16·59	8 36·1	41 0·08	26 59·8	33 38·08	38 8·03	22 15·32	.....	0 47 3·74	26 59·61	1 23·93	0 31·73	3 44·25
28	28 29·31	5 51·64	38 16·22	24 15·75	30 54·36	35 24·09	19 31·45	.....	44 20·02	24 16·05	2 58 39·09	3 57 47·59	1 0·14
29	29 41 12	.....	.....	0 20 49	0 27 26·66	0 31 57·47	2 16 4·92						
30	7 30 10·33	4 59 41·82	.....	18 4·7	24 43·87	29 14·19	.....	.....	0 38 8·79	2 18 4·87	2 52 28·28	3 51 37·28	4 54 50·04
31	.....	56 57	.....	.....	.....	.....	.....	.....	35 25·28	15 20·94	.....	.....	52 5·35
Nov. 2	.....	51 29·05	.....	9 53·2	16 31·72	21 1·41	5 8·63	.....	.....	9 53·49	44 16·7	.....	46 37·31
3	.....	48 45·84	.....	7 9·84	13 48·15	18 17·52	2 2 24·52	.....	27 12·79	7 8·73	.....	40 41·06	43 53·66
4	7 36 11·07	46 1·35	.....	4 25·17	11 4·04	15 33·43	1 59 40·53	.....	24 29·37	4 25·04	38 48·28	37 57·22	41 10·02
5	37 23·22	43 16·74	.....	.....	11 50 43·82	.....	1 39 20·22	2 19 20·74	21 44·93	.....	36 4·11	35 12·57	38 25·26
6	7 20 58·58	4 22 56·14	.....	11 41 20·54	11 47 59·04	11 52 28·88	36 35·65	.....	0 1 24·17				
7	22 10·12	20 11·33	.....	38 35·73	45 14·31	49 44·18	33 50·97	13 50·74	11 58 39·25	.....	2 12 58·13	3 12 7·25	
8	23 21·35	.....	.....	35 50·61	42 29·74	46 59·06	31 6·02	.....	55 54·3	1 35 50·56	10 13·44	9 22·68	
13	.....	.....	4 22 23·57	5 8 23·14	5 15 1·5	5 19 31·92							
14	1 16 43·19	9 47 10·13	19 33·22	5 32·72	12 11·33	16 41·01	7 0 48	.....	.....	7 5 34·1	.....	8 39 5·8	9 42 18·19
15	17 49·26	44 20·26	16 42·67	2 42·71	9 21·49	13 51·05	6 57 57·27	7 37 56·8	5 22 48·79				
16	.....	41 29·38	.....	4 59 52·51	6 31·01	11 0·89	55 7·25	35 6·87	19 58·41	6 59 53·82	7 34 16·9	33 25·58	36 37·99
17	20 0·95	.....	.....	.....	.....	.....	.....	32 17·06					
18	21 6·88	35 49·03	.....	54 12·05	.....	5 20·26	49 27·02	29 26·65	.....	54 13·44	28 36·33	27 45·09	30 57·82
19	22 12·75	32 58·69	.....	51 21·83	4 58 0·64	2 30·56	.....	.....	.....	51 23·15	.....	24 54·7	28 7·33
20	23 18·54	30 8·7	.....	48 31·76	55 10·23	4 59 39·84	.....	23 46·19	8 37·12	.....	22 55·81	22 4·62	25 17·25
21	24 24·56	27 18·24	.....	45 41·1	52 19·46	56 49·65	.....	20 55·47	5 46·7	.....	20 5·1	19 13·66	22 26·59
22	25 30·31	24 27·1	3 56 50·77	.....	.....	.....	.....	.....	2 56·5	.....	17 14·65	16 23·08	19 35·51

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1830.	Mean Noon by Sun.	α Ceti.	α Persei.	ϑ Persei.	η Tauri.	γ Tauri.	ε Tauri.	Aldebaran.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
January 6	.....	7 29 33·71	7 48 20·36	.....	8 13 23·53	8 45 59·75	8 54 31·83	9 1 58·38
7	11 38 30·75	23 52·29	42 38·21	8 1 11·74	7 41·12	40 18·08	48 49·9	8 56 16·42
8	36 44·73	18 8·89	36 55·92	7 55 29·34	1 59·24	34 35·24	43 7·65	50 34·12
9	34 58·32	12 27·98	31 13·96	49 47·35	7 56 17·25	28 53·69	37 25·89	44 52·61
10	33 12·26	6 46·29	25 32·96	44 6·18	50 35·97			
11	31 26·9	1 4·69	.....	38 25·55	44 54·19	17 31·23	26 3·03	33 29·94
12	29 40·78	6 55 23·41	14 10·41	32 43·38	39 13·04	11 49·55	20 21·31	27 48
13	27 54·72							
14	.....	43 59·9	2 46·56	21 19·79	27 49·77	8 0 25·81	8 8 58·07	16 25·1
16	22 36·98							
17	.....	.....	.....	4 14·91	10 44·87	7 43 21·5	7 51 53·95	7 59 20·62
18	11 19 5·27							
22	9 26 10·6	4 13 10·27	4 31 59·16	4 50 33·85	4 57 4·19	5 29 43·08	5 38 16·07	5 45 43·58
23	26 27·11	9 31·21	28 18·46	46 53·13	53 24·37	26 3·28	34 36·33	42 3·57
24	26 44·05	.....	24 40·36	43 15·17	49 45·91	22 25·06	30 57·83	38 25·31
25	27 2·89	.....	.....	39 36·38	46 6·59	.....	27 19·05	34 46·03
27	27 34·33	.....	.....	.....	.....	.....	.....	27 27·97
28	.....	.....	.....	.....	35 9·24	.....	16 21·13	23 48·28

1830.	Capella.	Rigel.	β Tauri.	ϑ Orionis.	ε Orionis.	ζ Orionis.	α Orionis.	β Aurigæ.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
January 6	9 39 49·35	9 42 0·31						
7	.....	36 18·89	.....	.....	.....	10 2 1·61	10 15 45·51	10 16 49·48
8	28 24·94	30 36·68	.....	.....	.....	.....	10 3·41	
9	22 43·12	24 55·13	9 34 4·3	9 41 48·34	9 46 3·1	9 50 37·65	4 21·95	5 28·03
10	17 0·87	19 13·77	28 22·65	36 6·54	40 21·82	44 55·82	9 58 40·2	9 59 46·15
11	11 19·78	13 32·62	22 41·36	30 25·38	34 40·2	39 14·79	52 58·8	9 54 4·31
12	.....	7 50·88	.....	24 43·94	28 58·42	33 32·78		
14	8 54 15·15	8 56 27·57	9 5 35·87	9 13 20·4	17 35·24			
17	37 10·45	39 23·08	8 48 32·39	8 56 16·08	9 0 31·01	9 5 5·56	9 18 49·84	
22	6 23 37·08	6 25 48·88	6 34 59·26	6 42 43·47	6 46 58·68	6 51 33·69	7 5 19·43	7 7 29·75
23	19 57·5	22 9·91	31 19·77	39 4·51	43 19·74	47 54·87	1 39·95	3 50·66
24	16 18·41	18 30·74	27 40·79	35 25·53	39 40·56	44 15·39	6 58 0·77	0 10·98
25	12 39·5	.....	.....	.....	36 2·05	40 36·49		
27	.....	7 32·88	16 43·44	24 27·83	28 42·92	33 17·96	47 3·35	6 49 13·6
28	1 41·44	3 53·93	13 4·02	20 48·91	25 3·84	29 38·77	43 23·87	45 34·08

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1830.	Capella.	β Tauri.	ϑ Orionis.	ι Orionis.	ζ Orionis.	β Aurigæ.	ϑ Scorpii.	β Scorpii.	Antares.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
February 26	.....	.....	.....	.....	.....	6 33 58·87	.....	.....	5 3 18·01
27	5 45 16·05	5 56 38·74	6 4 23·45	6 8 38·51	6 13 12·73	28 1·69	4 28 46·54	4 34 1·06	4 57 21·22
28	39 19·39	50 41	5 58 25·81	2 41·01	7 15·32	22 4·19	22 49·31	28 3·97	51 24
March 1	.....	44 43·82	52 28·7	5 56 43·62	1 18·11	16 7·16	16 51·98	22 6·74	45 26·52
2	.....	38 47·03	46 31·37	50 46·05	5 55 20·57	10 8·91	10 53·93	16 9·05	39 29·09
3	.....	32 49·12	40 33·63	44 48·94	49 23·71	4 12·17	.....	.....	33 31·4
4	.....	26 51·93	34 37·03	38 52·01	43 26·57	5 58 14·66	3 58 59·91	4 14·92	27 33·93
5	.....	20 54·43	28 39·09	32 54·47	37 28·66	52 17·36	53 2·46	3 58 17·4	21 37·47
6	.....	14 56·95	22 41·58	26 56·57	31 31·47	46 20·15	47 5·46	52 19·79	15 39·81
7	.....	8 59·55	16 44·16	20 59·39	25 33·79	.....	41 7·7	46 22·6	9 42·72
8	.....	3 2·46	10 46·98	15 1·69	19 36·18	34 25·35	35 11·41	40 26·01	3 45·7
9	.....	4 57 5·42	4 50·13	9 4·82	.....	.....	29 13·76	34 28·42	3 57 48·71

1830.	Castor.	Procyon.	Pollux.	γ Geminor.	ι Geminor.	ϑ Geminor.	α Herculis.	α Ophiuchi.	α Lyræ.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
February 26	.....	8 16 54·39							
27	8 4 18·62	10 56·82	8 15 26·26	7 8 41·24	7 14 14·62	7 50 35·48			
28	7 58 21·14	4 59·04	9 28·14	2 43·76	8 17·04				
March 1	52 24·32	7 59 2·22	3 31·32	6 56 46·88	2 20·63				
2	.....	53 4·77	7 57 33·37	50 49·24	6 56 22·35				
3	40 30·22	47 7·72	51 36·02	44 52·24	50 26·11				
4	34 31·78	41 10·08	45 38·86	38 54·77	44 27·91				
6	.....	.....	33 43·89						
8	10 42·67	17 21·22	21 49·56						
17	6 16 1·53	6 22 40·3	6 27 9·36	5 20 19·8	5 25 53·59	6 2 17·49	3 57 34·23	4 17 39·3	5 21 35·9
18	12 2·32	18 41·17	23 10·47	5 16 20·7	21 54·66	5 58 18·63	53 35·37	13 40·54	17 37·63
19	8 3·03	14 42·28	19 11·15	12 21·72	17 55·22	54 19·12	49 36·27	9 41·54	13 38·31
20	4 3·89	10 42·94	15 12·05	8 22·48	13 56·31	50 20·06	45 37·28	5 42·53	9 39·08
21	0 4·76	6 43·81	11 12·78	4 23·06	9 56·82	46 20·85	41 38·17	1 43·43	
22	5 56 5·91	2 45·17	7 14·24	0 24·6	5 58·36	42 22·01	37 39·25	3 57 44·84	1 40·99
23	52 7·89	5 58 46·45	3 16·02	4 56 25·78	1 59·54	38 23·77	33 40·62	53 46·07	4 57 42·43
24	48 9·1	.....	.....	52 27·41	4 58 1·08	34 25·36	29 42·14	49 47·4	53 43·99
25	44 10	50 49·06	5 55 18·23	48 28·57	54 2	30 26·46	25 43·11	45 48·44	49 44·75
26	40 10·7	46 49·67	51 18·84	44 29·18	50 2·74	26 26·79	.....	41 49·87	45 46·02
27	.....	.....	47 20·28	40 30·87	46 4·13	22 28·42	17 45·63	37 50·93	41 47·53
28	.....	.....	.....	.....	.....	.....	13 46·4	33 52·08	37 48·6
29	.....	.....	.....	32 32·45	.....	.....	9 47·84	29 53·01	33 49·01
30	.....	.....	.....	28 33·58	34 7·22				

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Ascension Island (Green Mountain).

1830.	Mean Noon by Sun.
	h m s
April 10	11 35 20·53
12	31 6·89
13	28 59·42
14	26 53·09

Fernando de Noronha.

1830.	Mean Noon by Sun.	Spica Virg.	ζ Ursæ Maj.	g Ursæ Maj.	ζ Virginis.	τ Bootis.	η Bootis.	α Draconis.	Arcturus.	γ Bootis.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
June 21	.....	.....	7 16 41·38	7 18 1·2	7 25 41·07	7 38 45·87	7 46 8·59	7 59 14·38	.....	8 24 37·45
22	11 56 44·11	.....	.....	.....	.....	33 8·05	40 31·01	.....	8 1 45·68	18 59·49
23	55 1·64	.....	5 26·51	6 46·51	14 25·55	27 31·04	34 53·62	47 59·88	7 56 7·76	
24	53 19·34	.....	6 59 48·71	1 9·08	8 48·66	21 53·28	29 16·03	42 22·2	50 30·42	7 44·91
25	51 37·59	.....	54 11·23	6 55 31·31	.....	.....	.....	36 44·18	.....	2 7·4
26	49 55·53	.....	.....	.....	6 57 32·6	10 37·82	18 0·64	31 6·96	39 14·71	7 56 29·14
27	48 13·43	.....	.....	.....	51 54·33	4 59·77	12 22·67	25 28·73	33 36·92	50 51·54
28	46 30·83	.....	37 18·72	38 38·74	46 16·86	.....	6 44·55	19 50·39	27 58·53	
29	44 48·46	6 30 53·5	.....	.....	40 38·53	.....	.....	14 11·52	22 20·56	39 35·43
30	43 6·01	25 15·67	.....	.....	35 0·6	.....	6 55 28·34	8 33·19	16 42·44	
July 1	41 23·9	.....	.....	.....	29 22·41	6 42 27·71	49 50·38	2 56·24	11 4·62	28 19·11
2	39 41·21									

1830.	π Bootis.	ι Bootis.	ξ Bootis.	β Ursæ Min.	β Bootis.	c Bootis.	δ Bootis.	μ Bootis.	α Cor. Bor.	α Serpentis.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
June 21	.....	.....	.....	.....	.....	8 59 6·37	9 7 52·82	9 17 15·62	9 26 39·59	9 35 2·64
22	.....	8 31 17·48	.....	8 44 53·12	8 49 11·66	53 28·69	2 15·15			
23	8 20 52·17	25 40·15	.....	39 17·28	43 33·87	47 51·03	8 56 38·42	6 1·15	15 24·83	
24	.....	20 2·57	.....	33 39·05	.....	42 14·02	51 0·3	.....	9 46·93	
25	.....	14 24·41	.....	.....	.....	.....	45 21·79	8 54 44·98	4 8·65	12 32·2
26	3 59·21	8 46·89	8 14 45·04	.....	26 41·29	30 58·41	.....	.....	8 58 31·59	6 54·72
27	7 58 21·33	3 9·08	9 7·13	16 46·34	.....	25 20·71	34 7·09	43 30·41	52 53·62	1 16·49
28	52 42·96	7 57 30·76	3 28·88	.....	.....	.....	28 28·92	37 51·82	.....	8 55 38·36
29	47 4·96	51 52·51	.....	5 28·53	.....	14 3·53	.....	32 13·09	41 36·83	50 0·28
30	.....	46 14·41	7 52 12·41	7 59 49·36	.....	8 25·76	17 12·09	26 35·16	35 58·94	44 22·19
July 1	35 48·65	40 36·36	46 35·01	54 13·13	.....	2 48·16	11 34·81			

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Maranham.

1830.	Antares.	τ Scorpii.	α Trian. Aust.	ι Aræ.	k Scorpii.	η Ophiuchi.	A. Ophiuchi.	α Aræ.	λ Scorpii.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
August 3	7 31 9·93	7 37 27·43	7 43 2·65	7 58 11·48	8 5 41·64	8 12 37·33	8 16 53·57	.....	8 34 0·47
4	25 20·65	31 38·17	37 12·69	52 22·12	7 59 52·53	6 48·4	11 4·17	8 24 52·97	28 11·30
5	19 31·36	25 49·1	31 23·86	46 32·89	54 3·5	0 59·14	5 15·12	19 4·07	22 22·59
6	13 42·22	20 0·08	25 34·41	40 43·9	48 14·11	7 55 9·93	7 59 25·87		
7	7 53·09	14 10·96	19 45·81	34 54·66	42 25·1	49 20·82	53 36·94	7 25·43	10 44·11
8	2 4·1	8 22·23	13 57·41	29 6·41	36 36·52	43 31·75	47 47·83		
9	6 56 15·28	2 32·81	8 7·64	23 16·66	30 47·17	37 42·74	41 58·59	7 55 47·57	7 59 6·24
10	50 26·31	6 56 43·34	2 17·79	17 27·17	24 57·64	31 53·45	36 9·31	49 57·84	53 16·66
11	44 36·38	50 53·91	6 56 28·64	11 37·87	19 8·25	26 3·95	30 20·01	44 8·73	47 27·25
12	38 47·03	45 4·87	50 40·13	5 48·92	13 19·02	20 14·83	24 30·77	38 19·58	41 38·36
19	.....	.....	.....	.....	.....	.....	.....	.....	6 46 30·97
20	.....	.....	.....	.....	.....	.....	.....	.....	42 16·20
21	.....	.....	.....	.....	.....	.....	.....	.....	38 2·49
22	.....	.....	.....	.....	.....	.....	.....	.....	33 48·03
23	.....	.....	.....	.....	.....	.....	.....	.....	29 33·14
25	.....	.....	.....	.....	.....	.....	.....	.....	21 3·97
26	.....	.....	.....	.....	.....	.....	.....	.....	16 48·91

1830.	π Pavonis.	γ Telescopii.	υ Ophiuchi.	ι Telescopii.	μ' Sagittarii.	ϑ Sagittarii.	α Telescopii.	Clypei Sob.	φ Sagittarii.
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
August 3	8 41 5·32	8 50 9·85	9 1 27·33						
4	35 16·60	44 20·63	8 55 38·17						
5	29 27·51	38 31·93	49 48·93						
7	17 49·03	26 53·26	38 10·7						
8	.....	21 4·61	32 21·82						
9	6 11·25	15 15·29							
10	0 21·77	9 25·79	20 43·26						
11	7 54 32·06	3 36·49	14 53·74						
12	48 43·44	7 57 47·38	9 4·68						
19	6 53 36·64	7 2 40·7	7 13 59·1	7 22 58·72	7 27 53·5	7 34 24·12	7 38 40·95	7 43 44·8	7 59 14·88
20	49 21·07	.....	9 44·67	18 43·41	23 38·92	30 9·4	34 26·11	39 30·13	55 0
21	45 8·1	6 54 12·5	5 30·4	14 29·64	19 24·86	25 55·32	30 12·13	35 16·04	50 45·96
22	40 53·48	49 58·49	1 16·46	10 15·69	15 10·76	21 41·09	25 58·03	31 1·92	46 31·74
23	36 37·8	45 43·02	6 57 1·84	6 0·37	10 55·86	17 26·53	21 43·09	26 47·45	42 17·12
25	28 9·54	37 14·41	48 32·36	6 57 31·29	2 26·44	8 56·97	13 13·58	18 17·7	33 47·51
26	23 53·86	32 59·44	44 17·75	53 16·49	6 58 11·79	4 42·38	8 58·94	14 3·1	29 33·03

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Para.

1830.	γ Hydri.	γ Reticuli.	41 Eridani.	43 Eridani.	ν^3 Eridani.	54 Eridani.	β Cœli Scalp.
			Brass Pendulums.				
	h m s	h m s	h m s	h m s	h m s	h m s	h m s
September 17	4 2 1·34	4 10 14·02	4 23 1·1	4 29 11·09	4 40 24·97	4 44 25·95	4 47 30·8
19	3 50 31·36	3 58 43·95	4 11 31·29	17 41·21	28 55·3	32 56·26	36 1·16
20	44 45·6	52 58·81	.....	11 56	23 9·97	27 10·84	30 15·89
21	39 1·47	47 13·85	0 0·61	6 10·6	17 24·58	21 25·45	24 30·24
22	33 15·77	41 28·49	3 54 15·35	0 25·4	11 40·08	15 40·41	18 45·34
23	27 30·55	35 43·2	48 30·33	3 54 40·3	5 54·2	9 55·17	13 0·08
24	21 44·87	29 57·74	42 44·74	48 54·54	0 8·52	4 9·33	7 14·58
25	15 59·92	24 12·62	36 59·14	43 9·01	3 54 23·01	3 58 24·07	1 29
27	4 28·43	12 40·62	25 27·63	31 37·84	42 51·92	46 52·77	3 49 57·72
			Copper and Iron Pendulums.				
September 17	3 4 46·17	3 12 59·41	3 25 47·26	3 31 57·64	3 43 12·22	3 47 13·49	3 50 18·49
19	2 56 12·95	4 26·09	17 14·2	23 24·52	34 39·3	38 40·49	41 45·6
20	51 55·69	0 9·46	.....	19 7·83	30 22·5	34 23·63	37 28·87
21	47 40·18	2 55 53·08	8 40·62	14 51	26 5·67	30 6·79	33 11·77
22	43 22·96	51 36·2	4 23·83	10 34·27	21 49·04	25 50·22	28 55·34
23	39 6·25	47 19·38	0 7·32	6 17·59	17 32·26	21 33·48	24 38·57
24	34 49·13	43 2·5	2 55 50·3	2 0·48	13 15·16	17 16·22	20 21·68
25	30 32·95	38 46·09	51 33·49	2 57 43·66	8 58·36	12 59·68	16 4·8
27	21 58·91	30 11·72	42 59·48	49 10·09	0 24·85	4 25·96	7 31·09
30	9 17·07	17 26·42	30 11·25	36 21·42	2 47 36	2 51 36·52	2 54 42·72

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Trinidad.

1830.	Mean Noon by Sun.	η Eridani.	α Ceti.	12 Eridani.	16 Eridani.	ϑ Tauri.	17 Eridani.	ε Eridani.	ϑ Eridani.	π Eridani.	β Reticuli.
					By Shelton's Clock.						
	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
Nov. 10	11 52 6·84	11 20 17·71	11 25 32·08	11 36 59·37	11 44 3·35	11 47 42·81	14 54 13·29	11 56 57·27	12 7 5·87	12 10 5·19	12 14 13·6
11	.....	.....	19 50·33	31 17·31	38 21·06	42 0·97	48 31·38	51 15·35	1 23·86	4 23·53	8 31·57
12	48 33·2	8 54·01	14 8·29	25 35·9	32 39·4	36 18·79	42 49·49	45 33·47	11 55 41·96	11 58 41·68	2 50·66
13	46 46·93	.....	8 26·24	19 53·78	26 57·51	30 37·24	37 7·52	39 51·49	50 0·07	52 59·53	11 57 7·6
14	45 0·56	.....	2 44·78	14 11·42	21 15·08	24 55·08	31 25·5	34 9·38	44 18·02	47 17·68	51 25·61
15	43 14·71										
16	41 28·71	10 46 6·79	10 51 21·43	2 47·88	9 51·81	13 31·94	20 2·04	22 45·92	32 54·68	35 54·34	40 2·31
17	39 42·63	40 25·4	45 39·66	10 57 6·59	4 10·53	7 50·53	14 20·52	17 4·68	27 13·13	30 12·6	34 20·69
18	37 56·56	.....	.....	51 25·22	10 58 29·2	2 8·99	8 39·08	11 22·96	21 31·75	24 31·31	28 39·57
19	36 10·89	29 2·54	34 17·04	45 43·89	52 47·93	10 56 27·77	2 58·06	5 41·94	15 50·54	18 49·81	22 58·13
20	.....	.....	.....	.....	.....	.....	10 57 16·72	0 0·7	10 9·24	13 9·06	
21	.....	17 40·14	22 54·22	34 20·52	41 25·03	45 4·8	51 35·03	10 54 18·92	4 27·87	7 27·44	
					By Graham's Clock.						
Nov. 10	11 56 44·67	11 25 50·68	11 31 5·49	11 42 33·69	11 49 38·21	11 53 17·96	11 59 48·96	12 2 33·15	12 12 42·57	12 15 42·13	12 19 50·87
11	.....	.....	27 16·15	38 44·03	45 48·33	49 28·52	55 59·44	11 58 43·64	8 52·94	11 52·84	16 1·2
12	56 56·4	18 11·44	23 26·13	34 54·64	41 58·69	45 38·37	52 9·58	54 53·77	5 3·06	8 3·01	12 12·32
13	57 2·2	.....	19 35·68	31 4·13	38 8·4	41 48·49	48 19·19	51 3·37	1 12·75	4 12·44	8 20·83
14	57 7·63	.....	15 45·6	27 13·05	34 17·34	37 57·61	44 28·55	47 12·64	11 57 22·07	0 21·96	4 30·21
15	57 13·17										
16	57 18·36	2 49·04	8 4·09	19 31·43	26 35·91	30 16·31	36 46·91	39 31·01	49 40·55	11 52 40·44	11 56 48·73
17	57 23·34	10 58 57·96	4 12·63	15 40·44	22 44·92	26 25·21	32 55·7	35 40·07	45 49·3	48 49	52 57·41
18	57 27·59	.....	.....	11 48·93	18 53·47	22 33·54	29 4·13	31 48·22	41 57·76	44 57·55	49 6·13
19	57 31·97	51 14·51	10 56 29·41	7 57·13	15 1·71	18 41·83	25 12·62	27 56·7	38 6·07	41 5·57	45 14·22
20	.....	.....	.....	.....	.....	.....	21 20·54	24 4·72	34 14·03	37 14·09	
21	.....	43 30·52	48 45	0 12·16	7 17·21	10 57·26	17 27·98	20 12·08	30 21·81	33 21·61	

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1830.		Mean Noon by Sun.	54 Eridani.	μ Eridani.	63 Eridani.	β Eridani.	Rigel.
		h m s	h m s	h m s	h m s	h m s	h m s
December	28	.....	9 56 9·33	10 0 7·67	10 14 51·7	10 22 31·83	10 29 22·59
	29	11 50 24·82	50 31·53	9 54 29·36	9 13·99	16 53·52	23 44·97
	30	48 42·98	44 53·79	48 51·52	3 35·99	11 15·54	18 7
	31	47 0·77	.....	.....	9 57 58·43	5 37·99	12 29·03
1831. January	1	45 18·63					
	2	.....	.....	.....	46 42·95	9 54 22·29	1 13·74
	3	.....	.....	26 20·58	41 4·87	.....	9 55 36·22
	4	.....	.....	.....	35 27·54	43 6·61	49 58·58
	5	.....	.....	15 4·72	29 49·31	37 29·36	44 20·55
	6	36 47·69	9 5 29·42	9 27·23	24 11·92	31 51·37	38 42·77
	7	35 5·56					

1830.		λ Leporis.	η Orionis.	β Leporis.	ε Orionis.	ζ Orionis.	α Argus.
		h m s	h m s	h m s	h m s	h m s	h m s
December	28	10 34 44·39	10 38 53·64	10 43 55·69	10 50 30·56	10 55 5·31	
	29	29 6·35	33 15·89	38 17·99	44 52·48	49 27·14	
	30	23 28·59	27 38·06	32 39·98	39 14·87	.....	11 31 43·73
	31	17 50·77	22 0·31	27 2·22	33 36·95	38 11·74	26 5·23
1831. January	2	6 34·99	.....	.....	22 21·49	26 56·23	14 49·92
	3	0 57·89	5 6·91	10 9·32	16 43·54	21 18·58	
	4	.....	.....	.....	11 6	.....	3 34·79
	5	9 49 42·08	9 53 51·81	9 58 53·38	5 28·38	10 2·9	10 57 56·78
	6	44 4·06	.....	53 15·91	9 59 50·66	.....	52 19·51

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TABLE IV.—Rate of the Pendulum Clock.

Monte Video.

	AUGUST, 1828.					SEPTEMBER, 1828.					
	From 26 to 27.	From 25 to 30.	From 27 to 30.	From 30 to 31.	From 31 to 1.	From 1 to 2.	From 1 to 3. 1 to 4. 2 to 3.	From 2 to 4. 3 to 4.	From 4 to 5.	From 4 to 6. 5 to 6.	From 5 to 7. 6 to 7.
Sun	s −47·50	s	s −47·47	s −49·6	s −46·92	s	s −47·65	s	s	s	s
Antares	.....	.....	−47·41	−48·57							
α Herculis	.....	.....	.....	49	−47·26	.....	−47·02	−47·29	−48·16	−45·33	−46·07
α Ophiuchi	.....	.....	.....	48·24	47·71	.....	46·81	47·37	47·63	45·54	46·56
β „	.....	.....	.....	48·04	47·79	.....	46·94	47·49	47·43	.....	46·15
γ „	.....	.....	.....	47·75	48·07	.....	46·89	47·52	46·89	.....	46·55
α Lyræ	.....	.....	.....	48·63	47·21	.....	47·58	46·54	.....	45·67	
β „	.....	.....	.....	48·29	47·30	.....	47·17	.....	.....	46·2	47·08
ζ Sagittarii	.....	.....	.....	47·77	48						
ζ Aquilæ	.....	−47·65	.....	48·24	47·3	.....	47·2	47·94	46·79	46·97	46·09
δ „	.....	47·6	.....	48·12	47·91	−46·51	47·05	47·58	46·3	46·91	
γ „	.....	47·65	.....	48·2	47·35	46·72	.....	47·39	46·55	46·71	46·51
α „	.....	47·82	.....	47·53	47·84	46·85	46·83	47·64	46·39	46·87	46·34
β „	.....	47·8	.....	47·86	47·59	46·84	.....	47·2	46·39	46·7	46·26
α^2 Capricorni	.....	47·7	.....	47·94	47·3	46·89	46·72	47·89	46·62	46·46	
α Cygni	.....	.....	.....	48·14	47·23	46·77	.....	47·3	.....	46·56	
Mean Rate for Stars	.....	−47·7	−47·41	−48·15	−47·56	−46·76	−47·02	−47·43	−46·92	−46·36	−46·4
Proportional part for $3^m 56^s$	.....	0·13	0·13	0·13	0·13	0·13	0·13	0·13	0·13	0·13	0·13
Daily Rate by Stars	.....	47·83	47·54	48·28	47·69	46·89	47·15	47·56	47·05	46·49	46·53
Mean Daily Rate by Sun and Stars	−47·5	−47·83	−47·51	−48·36	−47·64	−46·89	−47·19	.....	−47·05	−46·49	−46·53

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APPENDIX. TABLE IV.—Staten Island.

Staten Island.

NOVEMBER, 1828.

	From 3 to 4.	From 4 to 5.	From 5 to 6.	From 3 to 10.	From 6 to 10.	From 10 to 11.	From 10 to 12. 11 to 12.	From 12 to 13.	From 13 to 14. 12 to 15.	From 13 to 15. 14 to 15. 13 to 16.	From 13 to 17. 15 to 16.	From 15 to 17.	From 17 to 20. 16 to 21. 15 to 21.	From 16 to 23. 17 to 21.	From 20 to 21.	From 21 to 22.
Sun	+34·94	+38·67	+35·92	...	+36·58	...	+36·19	+37·15	...	...	+36·22	...	...	+36·64	...	+35·22
Fomalhaut	...	...	...	+36·50	...	+36·08	+36·17	+36·53	+36·49	+36·40	...	+36·20	+36·28	...	+35·85	
2 Ceti	...	...	...	...	...	...	36·70	35·96	...	36·48	...	36·88				
γ Pegasi	...	...	...	36·44	...	...	36·45	36·18	...	36·34						
8 Ceti	...	...	...	36·46	...	...	36·20	36·62	...	36·41						
β "	...	...	...	36·41	...	...	36·36	36·26	...	36·35	...	...	36·23			
η "	...	...	...	...	...	...	36·41	36·42	...	36·32	...	...	36·30			
ι "	...	...	...	...	...	...	36·50	36·55	...	36·25	...	...	...	+36·22		
τ "	...	...	...	...	...	...	36·73	...	36·34	...	+36·22	...	36·26			
ζ "	...	...	...	...	...	...	36·67	...	36·22	...	36·32	...	36·20			
Mean Rate for Stars	...	...	...	+36·45	...	+36·08	+36·47	+36·36	+36·35	+36·36	+36·27	+36·54	+36·25	+36·22	+35·85	
Proportional part for 3m 56s	...	...	...	0·10	...	0·10	0·10	0·10	0·10	0·10	0·10	0·10	9·10	0·10	0·10	
Daily Rate by Stars	...	...	...	36·55	...	36·18	36·57	36·46	36·45	36·46	36·37	36·64	36·35	36·32	35·95	
Mean Daily Rate by Sun and Stars	+34·94	+38·67	+35·92	...	+36·58	...	+36·53	+36·55	...	...	+36·32	...	...	+36·48	...	+35·22

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Staten Island (continued).

	NOVEMBER, 1828.				DECEMBER, 1828.											
	From 21 to 23. 22 to 23.	From 23 to 24. 21 to 26.	From 23 to 26.	From 24 to 26.	From 1 to 3.	From 3 to 4.	From 4 to 5.	From 1 to 9. 5 to 6.	From 3 to 9. 6 to 7.	From 7 to 9.	From 9 to 10.	From 9 to 12. 10 to 11.	From 9 to 13.	From 11 to 13. 12 to 13.	From 13 to 14.	From 13 to 15. 14 to 15.
	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
Sun	+36·18	+36·59	...	+36·38	+137·18	+138·08	+137·14	+137·75	+136·84	+137·75	+136·49	+136·18	....	+137·10	+136·67	+136·98
Fomalhaut	...	+36·44														
β Ceti	+36·17	...	...	...	....	....	....	....	+136·92							
η „	36·06	...	+36·02													
ι „	...	...	36·25													
τ „	36·17	...	36·25	...	....	....	....	....	136·94	....	....	....	+136·25	....	....	+136·99
ζ „	36·39	...	36·12	...	....	....	....	....	136·99	....	....	....	136·47			
δ „	...	...	36·27	...	....	....	....	+136·95	....	....	....	....	136·49			
γ „	...	...	36·29	...	....	....	....	136·97	....	....	....	....	136·39			
η Eridani	...	...	...	...	....	....	....	137·02	....	....	....	+136·38	....	+136·73	+135·71	136·69
α Ceti	...	...	...	...	....	....	....	137·01	....	....	....	136·30	....	136·69	136·24	136·95
12 Eridani	...	...	36·20	...	+137·04	....	....	....	136·99	....	....	136·36	....	136·75	136·14	136·50
16 „	...	...	36·26	...	136·95	....	....	....	136·98	....	....	136·43	....	136·45	136·15	137·22
ε „	36·0	...	36·15	...	136·96	....	....	....	137·01	....	....	136·39	....	136·45	136·30	136·58
δ „	...	...	36·12	...	136·96	....	....	....	136·96	....	....	136·41	....	136·54	136·48	136·46
γ „	36·0	...	36·11	...	137·10	....	....	....	136·94	....	....	136·44	....	136·43	136·28	136·67
Mean Rate for Stars	+36·13	+36·44	+36·19	...	+137·0	....	....	+136·99	+136·97	....	....	+136·39	+136·40	+136·58	+136·19	+136·76
Proportional part for 3m 56s	0·10	0·10	0·10	...	0·38	....	....	0·38	0·38	....	....	0·38	0·38	0·38	0·38	0·38
Daily Rate by Stars	36·23	36·54	36·29	...	137·38	....	....	137·37	137·35	....	....	136·77	136·78	136·96	136·57	137·14
Mean Daily Rate by Sun and Stars	+36·22	+36·57	...	+36·38	+137·35	+138·08	+137·14	+137·45	+137·29	+137·75	+136·49	+136·70	....	+136·98	+136·58	+137·12

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South Shetland.

	JANUARY, 1829.						FEBRUARY, 1829.									
	From 18 to 23.	From 17 to 28.	From 17 to 1. 23 to 26.	From 26 to 29.	From 28 to 1. 29 to 1.	From 1 to 2.	From 2 to 3. 1 to 4.	From 3 to 4.	From 4 to 5.	From 5 to 7.	From 9 to 10.	From 10 to 12.	From 12 to 13.	From 13 to 17.	From 17 to 23.	From 23 to 25.
Sun	+78·80	...	+78·94	+78·87	+80·02	+79·33	+79·24	+80·39	+79·72	+79·91	+160·94	+159·81	+161·85	+161·03	+161·57	+161·68
Rigel	...	...	...	...	+78·69	...	+79·45	...	+80·31	+79·34						
α Columbæ	...	+78·60	...	...	78·67	...	79·50	...	79·72	79·49						
α Orionis	...	...	+78·64	...	...	...	79·51	...	79·74	79·76						
Sirius	...	...	78·62	...	...	...	79·59	...	80·12	79·41						
Procyon	...	...	...	...	...	...	79·62	...	80·38	79·12						
α Hydræ	...	...	...	...	...	...	79·56	...	79·56	79·51						
Mean Rate for Stars	...	+78·60	+78·63	...	+78·68	...	+79·54	...	+79·97	+79·44						
Proportional part for $3^m\ 56^s$	...	0·22	0·22	...	0·22	...	0·22	...	0·22	0·22						
Daily Rate by Stars	...	78·82	78·85	...	78·90	...	79·76	...	80·19	79·66						
Mean Daily Rate by Sun and Stars	+78·80	+78·82	+78·88	+78·87	+78·94	+79·33	+79·69	+80·39	+80·12	+79·70	+160·94	+159·81	+161·85	+161·03	+161·57	+161·68

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Cape Horn.

	APRIL, 1829.														MAY, 1829.	
	From 15 to 16.	From 16 to 19.	From 19 to 21. 19 to 22.	From 19 to 23. 21 to 22.	From 21 to 23. 21 to 24. 22 to 23.	From 22 to 25. 23 to 24.	From 22 to 27. 23 to 25.	From 23 to 27. 24 to 26.	From 24 to 28. 25 to 27.	From 27 to 28.	From 22 to 4. 23 to 4. 26 to 1.	From 25 to 3. 27 to 1.	From 27 to 3. 28 to 3.	From 28 to 4.	From 1 to 3.	From 3 to 4.
Sun	s +45·03	s ...	s +45·07	s ...	s +45·56	s +45·13	s ...	s +44·73	s ...	s ...	s +45·33	s	s	s	s	s
α Argus	...	...	...	...	+45·20											
Sirius	...	...	+44·91													
γ^2 Argus	...	...	45·14	+45·44												
α Hydræ	...	+45·07	45·01	...	44·99	...	...	...	+44·85	...	...	...	....	+45·17		
Regulus	...	...	...	45·03	...	...	+45·27									
μ Hydræ	...	...	44·49	45·60	45·68	...	...	...	...	...	+45·01					
ν Hyd. et Crat.	...	...	45·24	44·67	...	...	...	...	...	...	44·97					
α „	...	...	44·83	45·15	...	+45·38	44·89	...	...	...	...	+44·97	...	...	...	+45·00
β „	...	...	45·08	44·99	...	...	...	...	...	...	...	...	+45·17			
δ „	...	...	44·97	45·12	...	45·18	...	...	...	...	...	44·99				
τ Leonis	...	...	45·12	44·68	...	45·34										
β Virginis	...	...	45·01	...	...	45·20	...	...	44·33	...	...	45·38	...	...	+44·73	45·73
δ Centauri	...	...	45·10	45·06	...	45·19	...	...	44·39							
γ Corvi	...	...	...	45·06	...	45·29	...	...	43·99	...	...	45·26	...	...	45·14	45·72
η Virginis	...	...	45·03	...	45·09	...	...	44·82	...	...	...	45·17	...	...	45·20	
δ „	...	...	...	45·07	45·19	...	...	44·74								
ε „	...	...	...	...	...	...	...	...	...	+45·10	...	...	45·16			
α „	...	...	45·09	45·34	...	...	44·79									
Mean Rate for Stars	...	+45·07	+45·00	+45·10	+45·23	+45·26	+44·98	+44·78	+44·39	+45·10	+44·99	+45·15	+45·17	+45·17	+45·02	+45·48
Proportional part for $3^m\ 56^s$	...	0·12	0·12	0·12	0·12	0·12	0·12	0·12	0·12	0·12	0·12	0·12	0·12	0·12	0·12	0·12
Daily Rate by Stars	...	45·19	45·12	45·22	45·35	45·38	45·10	44·90	44·51	45·22	45·11	45·27	45·29	45·29	45·14	45·60
Mean Daily Rate by Sun and Stars	+45·03	...	+45·12	...	+45·39	+45·34	...	+44·84	...	...	+45·18					

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Cape of Good Hope.

	AUGUST, 1829.						SEPTEMBER, 1829.					
	From 7 to 8.	From 7 to 9. 8 to 9.	From 9 to 10.	From 9 to 11. 10 to 11.	From 9 to 13. 10 to 13. 11 to 12.	From 11 to 13. 12 to 13.	From 27 to 28.	From 28 to 29.	From 28 to 1. 28 to 2.	From 29 to 2.	From 1 to 2.	From 2 to 4.
Sun	s	s −58·85	s	s −60·74	s −58·66	s −60·70	s −60·66	s −60·07	s	s −61·35	s	s −61·10
Antares.....	.....	−59·71	−60·00	−59·56	.....	−60·26						
α Herculis.....	−60·24	60·20	.....	60·21	.....	59·16						
α Ophiuchi	.....	61·23	.....	59·28	.....	60·01						
β „	.....	60·39	.....	59·79	.....	60·08						
γ „	.....	60·63	.....	60·03	.....	59·62						
α Lyræ.....	60·09	60·64	59·59	59·68	.....	60·11	.....	.....	−60·67	.....	−60·03	
β „	59·91	60·70	59·45	60·21	.....	59·80	.....	.....	60·98	.....	61·49	
γ „	59·69	60·75	59·43	59·25	.....	59·90	−60·35	.....	60·93	.....	61·02	
ζ Aquilæ.....	60·85	59·25	59·36	59·76	.....	60·33	60·22	.....	60·87	.....	61·36	−60·90
δ „	.....	59·98	.....	.....	−60·05	.....	60·41	.....	60·75	.....	61·47	
γ „	60·50	59·37	.....	.....	60·18	.....	.....	.....	60·92			
α „	60·32	59·91	60·11	.....	60·02	.....	60·38	.....	60·95			
β „	60·62	59·67	.....	.....	60·07	.....	60·74	.....	60·89			
α^2 Capric.....	59·34	60·09	60·35	.....	60·09	.....	59·54	.....	61·05			
γ Cygni.....	60·62	59·82	59·98	.....	60·16	.....	.....	.....	61·02			
α „	60·42	60·43	59·89	.....	60·01	.....	60·65	.....	60·91			
Mean Rate for Stars	−60·24	−60·17	−59·80	−59·75	−60·08	−59·92	−60·33	.....	−60·90	.....	−61·07	−60·90
Proportional part for $3^m\ 56^s$	0·16	0·16	0·16	0·16	0·16	0·16	0·16	.....	0·16	.....	0·16	0·16
Daily Rate by Stars	60·40	60·33	59·96	59·91	60·24	60·08	60·49	.....	61·06	.....	61·23	61·06
Mean Daily Rate by Sun and Stars	.....	−60·24	.....	−60·00	−60·04	−60·14	−60·51	−60·07	.....	−61·35	.....	−61·08

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Appendix. Table IV.—Cape of Good Hope.

Cape of Good Hope (continued).

	OCTOBER, 1829.							NOVEMBER, 1829.					
	From 25 to 26.	From 26 to 27.	From 27 to 28.	From 28 to 29.	From 29 to 30.	From 30 to 31.	From 29 to 2. 30 to 2.	From 30 to 3. 30 to 4. 31 to 2. 31 to 3.	From 2 to 3.	From 2 to 4. 3 to 4.	From 4 to 5.	From 5 to 6.
	s	s	s	s	s	s	s	s	s	s	s	s
Sun	.....	+71·97	+72·72	+71·81	.....	.....	.....	+72·15	.....	.....	+72·15	
γ Pegasi	.....	+72·43	+71·45	.....	.....	+71·09	.....	+71·93	+72·70	+71·42	+71·30	
Sirius	+71·87	71·91	72·05									
Castor	71·78	72·28	71·86	.....	+71·61	.....	+72·08	.....	72·55	71·24		
Procyon	72·38	71·62	72·19	.....	73·12	.....	71·86	.....	72·34	71·80	.....	+71·13
Pollux	72·17	72·02	71·97	.....	72·53	.....	71·65	.....	72·02	71·82		
α Hydræ	72·05	71·92	72·44	.....	.....	.....	71·84	.....	71·80	71·92	.....	71·34
α Aquilæ	.....	.....	72·19	.....	.....	72·40	.....	71·75	.....	72·49	71·47	
β Aquarii	.....	71·44	72·35	.....	.....	71·98	.....	72·18	71·15	72·22		
α "	.....	72·25	71·07	.....	.....	.....	72·05	.....	.....	71·70	71·74	
α Pegasi	.....	71·98	71·77	.....	.....	.....	.....	71·85	.....	72·07	71·26	
α Andromedæ	.....	72·24	71·80	.....	.....	71·22	.....	71·89	72·26	72·27	71·15	
Mean Rate for Stars	+72·05	+72·01	+71·92	.....	+72·42	+71·67	+71·90	+71·92	+72·12	+71·90	+71·38	+71·24
Proportional part for 3m 56s	0·20	0·20	0·20	.....	0·20	0·20	0·20	0·20	0·20	0·20	0·20	0·20
Daily Rate by Stars	72·25	72·21	72·12	.....	72·62	71·87	72·10	72·12	72·32	72·10	71·58	71·44
Mean Daily Rate by Sun and Stars	.....	+72·19	+72·17	+71·81	.....	.....	.....	+72·13	.....	.....	+71·68	

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Cape of Good Hope (continued).

	NOVEMBER, 1829.										
	From 5 to 7. 6 to 7.	From 7 to 8.	From 13 to 14.	From 14 to 15.	From 14 to 16. 15 to 16.	From 15 to 17. 16 to 17.	From 16 to 18. 16 to 19. 17 to 18.	From 16 to 20. 18 to 19. 15 to 22.	From 18 to 20. 19 to 20.	From 20 to 21.	From 21 to 22.
Sun	+71·54	+71·23	.....	+66·07	.....	+65·85	+65·93	+65·87	+65·79	+66·02	+65·75
γ Pegasi	+71·10	.....	.....	+66·04	+65·03	.....	+65·73	+65·57	+65·92	+65·45	+64·77
Sirius.....	.....	.....	+65·56	65·36	.....	.....	.....	65·64			
Castor.....	71·10	+70·79	65·49	65·90	65·71	.....	65·68	65·69	65·84	65·25	
Procyon.....	71·18	71·34	65·74	66·07	65·43	.....	65·79	.....	65·50	65·14	
Pollux	71·21	70·79	65·00	65·95	65·75	.....	65·59	66·21	65·19	65·72	
α Hydræ.....	71·26	70·96	.....	65·18	65·89	.....	65·79				
Regulus.....	70·91	.....	.....	.....	65·98	+66·10	65·50	.....	65·68	65·19	
α Aquilæ.....	70·99	70·96	.....	.....	65·53	.....	.....	65·59	.....	65·49	65·71
β Aquarii	.....	.....	.....	.....	65·77	.....	66·22	65·62			
α „	.....	71·22	.....	.....	.....	.....	65·62	.....	65·65	65·20	65·46
α Pegasi	.....	71·34	.....	.....	65·80	.....	65·66	65·52	65·83	64·95	65·33
α Andromedæ.....	.....	.....	.....	.....	65·81	.....	65·82	65·42	65·83	65·25	64·82
Mean Rate for Stars	+71·11	+71·06	+65·45	+65·75	+65·67	+66·10	+65·74	+65·66	+65·68	+65·29	+65·22
Proportional part for 3m 56s	0·20	0·20	0·18	0·18	0·18	0·18	0·18	0·18	0·18	0·18	0·18
Daily Rate by Stars	71·31	71·26	65·63	65·93	65·85	66·28	65·92	65·84	65·86	65·47	65·40
Mean Daily Rate by Sun and Stars	+71·34	+71·26	.....	+65·95	.....	+66·07	+65·92	+65·84	+65·85	+65·53	+65·46

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Appendix. Table IV.—St. Helena.

St. Helena.

JANUARY, 1830.

	From 6 to 7.	From 6 to 8. 7 to 8.	From 7 to 9. 8 to 9.	From 9 to 10.	From 9 to 11. 10 to 11.	From 10 to 12. 11 to 12.	From 11 to 14. 12 to 13.	From 12 to 14.
	"	"	"	"	"	"	"	"
Sun	.....	−106·02	−106·41	−106·06	−105·36	−106·12	−106·06	
α Ceti	−105·51	−107·49	−105·00	−105·78	−105·69	−105·37	.....	−105·85
α Persei	106·24	106·38	106·05	105·09	.....	105·37	.....	106·02
ζ "	.....	106·49	106·08	105·26	104·72	106·26	.....	105·89
η Tauri	106·50	105·97	106·08	105·37	105·87	105·24	.....	105·73
γ "	105·76	106·93	105·64	.....	105·32	105·77	.....	105·96
ι "	106·02	106·34	105·85	.....	105·52	105·81	.....	105·71
Aldebaran	106·05	106·39	105·60	.....	105·43	106·03	.....	105·54
Capella	.....	106·29	105·91	106·34	105·18	.....	−105·63	
Rigel	105·51	106·30	105·64	105·45	105·24	105·83	.....	105·75
β Tauri	.....	.....	.....	105·74	105·38	.....	105·92	
ζ Orionis	.....	.....	.....	105·89	105·25	105·53	.....	105·86
ι "	.....	.....	.....	105·37	105·71	105·87	.....	105·68
ζ "	.....	.....	106·07	105·92	105·12	106·10		
α "	.....	106·19	105·55	105·84	105·49			
β Aurigæ	.....	.....	104·82	105·97	105·93			
Mean Rate for Stars	−105·94	−106·48	−105·69	−105·67	−105·42	−105·74	−105·78	−105·80
Proportional part for $3^m 56^s$	0·29	0·29	0·29	0·29	0·29	0·29	0·29	0·29
Daily Rate by Stars	106·23	106·77	105·98	105·96	105·71	106·03	106·07	106·09
Mean Daily Rate by Sun and Stars	.....	−106·70	−106·01	−105·97	−105·69	−106·04	−106·07	

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St. Helena (continued).

	JANUARY, 1830.								
	From 11 to 17. 12 to 17. 13 to 16.	From 14 to 17.	From 16 to 18.	From 22 to 23.	From 23 to 24.	From 24 to 25.	From 24 to 27.	From 25 to 27. 25 to 28.	From 27 to 28.
Sun	s −105·91	s	s −105·86	s +16·51	s +16·94	s	s +16·76	s	s
α Ceti	.....	.....	.....	+16·85					
α Persei	.....	.....	.....	15·21	+17·81				
ϑ „	.....	−105·72	.....	15·19	17·95	+17·12			
η Tauri	.....	105·72	.....	16·09	17·45	17·59	.....	+16·79	
γ „	.....	105·53	.....	16·11	17·69				
ι „	.....	105·96	.....	16·17	17·41	17·13	.....	16·60	
Aldebaran	.....	105·58	.....	15·90	17·65	16·63	.....	16·88	+16·22
Capella	.....	105·66	.....	16·33	16·82	17·00	.....	16·56	
Rigel	.....	105·59	.....	16·94	16·74	.....	+16·62	.....	16·96
β Tauri	.....	105·25	.....	16·42	16·93	.....	16·79	.....	16·49
ϑ Orionis	.....	105·53	.....	16·95	16·93	.....	16·68	.....	16·99
ι „	.....	105·50	.....	16·97	16·73	17·40	.....	16·34	16·83
ζ „	−105·53	.....	.....	17·09	16·43	17·01	.....	16·64	16·72
α „	105·58	.....	.....	16·43	16·73	.....	16·77	.....	16·43
β Aurigæ	.....	.....	.....	16·82	16·23	.....	16·78	.....	16·39
Mean Rate for Stars	−105·56	−105·60	.....	+16·36	+17·11	+17·13	+16·73	+16·64	+16·63
Proportional part for 3m 56s	0·29	0·29	.....	0·05	0·05	0·05	0·05	0·05	0·05
Daily Rate by Stars	105·85	105·89	.....	16·41	17·16	17·18	16·78	16·69	16·68
Mean Daily Rate by Sun and Stars	−105·87	.....	−105·86	+16·42	+17·14	.....	+16·78		

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Appendix. Table IV.—Ascension Island.

Ascension Island.

	FEBRUARY, 1830.			MARCH, 1830.								
	From 26 to 27.	From 27 to 28.	From 28 to 1.	From 1 to 2.	From 1 to 3. 2 to 3.	From 2 to 4. 3 to 4.	From 4 to 5.	From 5 to 6. 4 to 6.	From 4 to 8. 6 to 7.	From 6 to 8. 7 to 8.	From 8 to 9.
	"	"	"	"	"	"	"	"	"	"	"
Capella	.....	−120·74		−120·88	−122·00	−121·28	−121·59	−121·57	−121·49	−121·18	−121·13
β Tauri	.....	121·83	−121·27	121·42	121·83	120·69	122·03	121·60	121·51	121·27	120·94
ϑ Orionis	.....	121·73	121·20	121·66	121·20	121·02	121·63	121·99	121·28	121·79	120·96
"	.....	121·59	121·48	121·63	120·95	121·23	122·00	121·28	121·77	121·70	
ζ "	.....	121·50	121·30	122·34	120·83	121·60	121·39	121·30	.....	121·49	
β Aurigæ	.....	−121·27	121·59	121·12	122·37	121·09	122·29	.....	.....	.....	
γ Geminorum	.....	121·57	120·97	121·73	120·33	122·29	.....	.....	121·37	.....	
"	.....	121·67	120·50	122·37	.....	121·14	122·53	.....	.....	121·26	
Castor	.....	121·57	120·91	.....	121·14	121·73	.....	.....	121·31	.....	
Procyon	.....	121·87	120·91	121·54	121·44	121·25	.....	121·58	.....	120·38	121·74
Pollux	.....	122·21	120·91	122·04	.....	121·10	121·54	121·09	121·85	120·68	121·68
ϑ Scorpii	.....	121·32	121·42	122·14	.....	121·16	121·61	121·70	121·28	121·11	121·08
β "	.....	121·18	121·32	121·78	.....	121·56	120·55	121·75	121·18		
Antares	.....	120·88	121·31	121·52	121·78						
Mean Rate for Stars		−121·27	−121·55	−121·14	−121·75	−121·25	−121·46	−121·54	−121·54	−121·45	−121·21	−121·26
Proportional part for $3^m\ 56^s$		0·33	0·33	0·33	0·33	0·33	0·33	0·33	0·33	0·33	0·33	0·33
Daily Rate by Stars		121·60	121·88	121·47	122·08	121·58	121·79	121·87	121·87	121·78	121·54	121·59

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Ascension Island (continued).

	MARCH, 1830.													APRIL, 1830.		
	From 17 to 18.	From 18 to 19.	From 19 to 20.	From 20 to 21.	From 20 to 22. 21 to 22.	From 22 to 23.	From 23 to 24.	From 23 to 25. 24 to 25.	From 25 to 26.	From 25 to 27. 26 to 27.	From 27 to 28.	From 27 to 29. 27 to 30. 28 to 29.	From 29 to 30.	From 10 to 12.	From 12 to 13.	From 13 to 14.
Sun	s ...	s ...	s ...	s ...	s ...	s ...	s ...	s ...	s ...	s ...	s ...	s ...	s ...	s −126·82	s −127·47	s −126·33
γ Geminorum	−3·19	−3·07	−3·33	−3·51	−2·55	−2·91	−2·46	−2·93	−3·48	−2·40	...	−3·30	−2·96			
"	3·02	3·53	3·00	3·58	2·55	2·91	2·55	3·17	3·35	2·70	...	3·06				
Castor	3·30	3·38	3·23	3·22	2·94	2·11	2·88	3·19	3·39							
Procyon	3·22	2·98	3·43	3·22	2·73	2·81	...	2·79	3·48							
Pollux	2·98	3·41	3·19	3·36	2·63	2·31	...	2·99	3·48	2·65						
α Herculis	2·95	3·19	3·08	3·20	3·01	2·72	2·57	3·12	...	2·83	−3·32	2·65				
α Ophiuchi	2·85	3·09	3·10	3·19	2·68	2·86	2·76	3·05	2·66	3·03	2·94	3·16				
α Lyræ	2·36	3·41	3·32	...	3·14	2·65	2·53	3·33	2·82	2·58	3·02	3·68				
Mean Rate for Stars	−2·98	−3·26	−3·21	−3·33	−2·78	−2·66	−2·63	−3·07	−3·24	−2·70	−3·09	−3·17	−2·96			
Proportional part for $3^m\ 56^s$	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·01			
Daily Rate by Stars	2·99	3·27	3·22	3·34	2·79	2·67	2·64	3·08	3·25	2·71	3·10	3·18	2·97			
Daily Rate by Sun.	...	...	...	...	...	...	...	...	...	...	...	...	...	−126·82	−127·47	−126·33

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Fernando de Noronha.

	JUNE, 1830.										
	From 21 to 22.	From 21 to 23. 22 to 23.	From 21 to 25. 22 to 24. 23 to 24.	From 23 to 25. 23 to 26. 24 to 25.	From 24 to 26. 24 to 27. 25 to 26.	From 25 to 27. 25 to 28. 26 to 27.	From 27 to 28.	From 27 to 29. 28 to 29.	From 27 to 1. 28 to 30. 29 to 30.	From 29 to 1. 30 to 1.	From 1 to 2.
Sun	s	s −102·47	s −102·30	s −101·75	s −102·06	s −102·10	s −102·60	s −102·37	s −102·45	s −102·11	s −102·69
Spica Virginis	.....	.....	.....	.....	.....	.....	.....	.....	−101·92		
ζ Ursæ Maj.	.....	−101·53	−101·89	−101·57	.....	−101·59					
g „	.....	101·44	101·52	101·86	.....	101·61					
ζ Virginis	.....	101·85	100·98	.....	−102·12	102·36	−101·56	−102·42	102·02	−102·28	
τ Bootis	−101·91	101·10	101·85	.....	101·82	102·14	.....	.....	102·11		
n „	101·67	101·48	101·68	.....	101·79	102·06	102·21	.....	102·20	102·05	
α Draconis	.....	101·34	101·77	102·11	101·31	102·32	102·43	102·96	102·42	101·04	
Arcturus	.....	102·01	101·43	.....	101·95	101·88	102·48	101·96	102·21	101·91	
γ Bootis	102·05	.....	101·38	101·60	102·35	101·69	.....	102·15	.....	102·25	
π „	.....	.....	.....	101·74	.....	101·97	102·46	102·09	.....	102·25	
ι „	.....	101·42	101·67	102·25	101·61	101·90	102·41	102·34	102·19	102·14	
ξ „	.....	.....	.....	.....	.....	102·00	102·34	.....	102·33	101·49	
β Ursæ Min.	.....	99·93	102·32	.....	101·66	.....	.....	102·99	103·26	100·32	
β Bootis	.....	101·88	.....	101·62							
c „	101·77	101·75	101·10	.....	101·90	101·79	.....	102·68	101·86	101·69	
b „	101·76	100·82	102·21	102·60	.....	101·44	102·26	.....	102·51	101·37	
μ „	.....	101·33	.....	102·18	.....	101·38	102·68	102·82	102·02		
α Cor. Bor.	.....	101·47	101·99	102·37	101·15	102·06	.....	102·49	101·98		
α Serpentis	.....	.....	101·70	.....	101·57	102·32	102·22	102·17	102·18		
Mean Rate for Stars	−101·83	−101·38	−101·68	−101·99	−101·75	−101·91	−102·31	−102·46	−102·23	−101·71	
Proportional part for 3m 56s	0·28	0·28	0·28	0·28	0·28	0·28	0·28	0·28	0·28	0·28	
Daily Rate by Stars	102·11	101·66	101·96	102·27	102·03	102·19	102·59	102·74	102·51	101·99	
Mean Daily Rate by Sun and Stars	.....	−101·71	−101·98	−102·22	−102·03	−102·18	−102·59	−102·71	−102·51	−102·00	−102·69

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	AUGUST, 1830.														
	From 3 to 4.	From 4 to 5.	From 5 to 6.	From 6 to 7. 5 to 7.	From 7 to 8.	From 8 to 9. 7 to 9.	From 9 to 10. 8 to 10.	From 10 to 11.	From 11 to 12.	From 19 to 20.	From 20 to 21. 19 to 21.	From 21 to 22.	From 22 to 23.	From 23 to 25.	From 25 to 26.
	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
Antares.....	−113·37	−113·38	−113·23	−113·22	−113·08	−112·91	−113·06	−114·02	−113·44						
τ Scorpii.....	113·35	113·16	113·11	113·21	112·82	113·51	113·56	113·52	113·13						
α Triang. Aust. ...	114·05	112·92	113·54	112·69	112·49	113·86	113·94	113·24	112·60						
ι Aræ	113·45	113·32	113·08	113·33	112·34	113·84	113·58	113·39	113·04						
k Scorpii.....	113·20	113·12	113·48	113·10	112·67	113·44	113·62	113·48	113·32						
α Ophiuchi.....	113·02	113·35	113·30	113·20	113·16	113·10	113·38	113·59	113·21						
A „	113·49	113·14	113·34	113·02	113·20	113·33	113·37	113·39	113·33						
α Aræ	....	112·99	....	113·41	....	113·02	113·82	113·20	113·24						
λ Scorpii.....	113·26	112·80	....	113·33	....	113·03	113·67	113·50	112·98	−18·86	−17·80	−18·55	−18·98	−18·68	−19·15
π Pavonis	112·81	113·18	....	113·33	....	112·98	113·57	113·80	112·71	19·66	17·06	18·71	19·77	18·22	19·77
γ Telescopii	113·31	112·79	....	113·43	112·74	113·41	113·59	113·39	113·20	....	18·19	18·10	19·56	18·40	19·06
υ Ophiuchi.....	113·25	113·33	....	113·21	112·97	....	113·37	113·61	113·15	18·52	18·36	18·03	18·71	18·83	18·70
ι Telescopii.....	....	....	....	....	....	....	....	....	....	19·40	17·86	18·04	19·41	18·63	18·89
μ′ Sagittarii	....	....	....	....	....	....	....	....	....	18·67	18·15	18·19	18·99	18·80	18·74
ϑ „	....	....	....	....	....	....	....	....	....	18·81	18·17	18·32	18·65	18·87	18·68
α Telescopii.....	....	....	....	....	....	....	....	....	....	18·93	18·07	18·19	19·03	18·85	18·73
Clypei Sob.....	....	....	....	....	....	....	....	....	....	18·76	18·18	18·21	18·56	18·97	18·69
φ Sagittarii	....	....	....	....	....	....	....	....	....	18·97	18·13	18·31	18·71	18·90	18·57
Mean Rate for Stars	−113·32	−113·12	−113·30	−113·21	−112·83	−113·31	−113·54	−113·51	−113·11	−18·95	−18·00	−18·27	−19·04	−18·72	−18·90
Proportional part for 3m 56s	0·31	0·31	0·31	0·31	0·31	0·31	0·31	0·31	0·31	0·05	0·05	0·05	0·05	0·05	0·05
Daily Rate by Stars	113·63	113·43	113·61	113·52	113·14	113·62	113·85	113·82	113·42	19·00	18·05	18·32	19·09	18·77	18·95

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Appendix. Table IV.—Para.

Para.

SEPTEMBER, 1830.

	From 17 to 19.	From 19 to 20.	From 19 to 21. 20 to 21.	From 21 to 22.	From 22 to 23.	From 23 to 24.	From 24 to 25.	From 25 to 27.	From 27 to 30.
				Brass Pendulums.					
	s	s	s	s	s	s	s	s	s
γ Hydri.....	−109·08	−109·85	−108·22	−109·79	−109·31	−109·77	−109·04	−109·84	
γ Reticuli	109·63	109·23	109·05	109·45	109·38	109·55	109·21	110·09	
41 Eridani.....	109·00	.....	109·43	109·35	109·11	109·68	109·69	109·85	
43 „	109·03	109·30	109·49	109·29	109·19	109·85	109·62	109·68	
ν^2 „	108·93	109·42	109·48	108·59	109·97	109·77	109·60	109·64	
54 „	108·94	109·51	109·48	109·13	109·33	109·93	109·35	109·74	
β Cœli Scalp.....	108·91	109·36	109·74	108·99	109·35	109·59	109·67	109·73	
Mean Rate for Stars	−109·07	−109·45	−109·27	−109·23	−109·38	−109·73	−109·45	−109·80	
Proportional part for 3m 56s	0·30	0·30	0·30	0·30	0·30	0·30	0·30	0·30	
Daily Rate by Stars	109·37	109·75	109·57	109·53	109·68	110·03	109·75	110·10	
				Copper and Iron Pendulums.					
γ Hydri.....	− 20·70	− 21·35	− 19·60	− 21·31	− 20·80	− 21·21	− 20·27	− 21·11	− 18·04
γ Reticuli	20·75	20·72	20·47	20·97	20·91	20·97	20·50	21·28	19·19
41 Eridani.....	20·62	.....	20·88	20·88	20·60	21·11	20·90	21·10	20·17
43 „	20·65	20·78	20·92	20·82	20·77	21·20	20·91	20·88	20·31
ν^2 „	20·55	20·89	20·92	20·72	20·87	21·19	20·89	20·85	20·37
54 „	20·59	20·95	20·93	20·66	20·83	21·35	20·63	20·95	20·57
β Cœli Scalp.....	20·54	20·82	21·19	20·52	20·86	20·98	20·97	20·95	20·21
Mean Rate for Stars	− 20·63	− 20·92	− 20·70	− 20·84	− 20·81	− 21·14	− 20·72	− 21·02	− 19·84
Proportional part for 3m 56s	0·06	0·06	0·06	0·06	0·06	0·06	0·06	0·06	0·06
Daily Rate by Stars	20·69	20·98	20·76	20·90	20·87	21·20	20·78	21·08	19·90

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APPENDIX. TABLE IV.—Trinidad.

Trinidad.

NOVEMBER, 1830.

	From 10 to 11.	From 10 to 12. 11 to 12.	From 12 to 13.	From 13 to 14.	From 12 to 16. 14 to 15.	From 14 to 16. 15 to 16.	From 16 to 17.	From 17 to 18.	From 17 to 19. 18 to 19.	From 19 to 20.	From 19 to 21. 20 to 21.
				Brass	Pendulums.—(Shelton)						
Sun	.....	−106·82	−106·27	−106·37	−105·85	−106·00	−106·08	−106·07	−105·67		
η Eridani	.....	−105·94	.....	.....	−105·90	.....	−105·48	.....	−105·52	.....	−105·29
α Ceti	−105·84	106·13	−106·14	−105·55	.....	−105·77	105·86	.....	105·40	.....	105·50
12 Eridani	106·15	105·50	106·21	106·45	.....	105·86	105·38	−105·46	105·42	.....	105·78
16 "	106·38	105·75	105·98	106·52	.....	105·73	105·37	105·42	105·36	.....	105·54
δ Tauri	105·93	106·27	105·64	106·25	.....	105·66	105·50	105·63	105·31	.....	105·58
17 Eridani	106·00	105·98	106·06	106·11	.....	105·82	105·61	105·53	105·11	−105·43	105·78
ε "	106·01	105·97	106·07	106·20	.....	105·82	105·33	105·81	105·11	105·33	105·87
δ "	106·10	105·99	105·98	106·14	.....	105·76	105·64	105·47	105·30	105·39	105·46
π "	105·75	105·94	106·24	105·94	.....	105·76	105·83	105·38	105·59	104·84	105·71
β Reticuli	106·12	105·00	107·15	106·08	.....	105·74	105·71	105·21	105·53		
Mean Rate for Stars	−106·03	−105·85	−106·16	−106·14	−105·90	−105·77	−105·57	−105·49	−105·37	−105·25	−105·61
Proportional part for $3^m\ 56^s$	0·29	0·29	0·29	0·29	0·29	0·29	0·29	0·29	0·29	0·29	0·29
Daily Rate by Stars	106·32	106·14	106·45	106·43	106·19	106·06	105·86	105·78	105·66	105·54	105·90
Mean Daily Rate by Sun and Stars	.....	−106·20	−106·43	−106·42	−106·02	−106·05	−105·88	−105·81	−105·66		

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Appendix. Table IV.—Trinidad.

Trinidad (continued).

NOVEMBER, 1830.

	From 10 to 11.	From 10 to 12. 11 to 12.	From 12 to 13.	From 11 to 14.	From 12 to 16. 14 to 15.	From 14 to 16. 15 to 16.	From 16 to 17.	From 17 to 18.	From 17 to 19. 18 to 19.	From 19 to 20.	From 19 to 21. 20 to 21.
	s	s	s	s	s	s	s	s	s	s	s
	.....	+5·87	+5·80	+5·43	+5·54	+5·19	+4·98	+4·25	+4·33	.....	+3·91
Sun	.....	+6·29	.....	.....	+5·31	.....	+4·83	.....	+4·18	.....	+3·91
γ Eridani	+6·57	5·89	+5·46	+5·83	.....	+5·15	4·45	.....	4·30	.....	3·70
α Ceti	6·25	6·52	5·40	4·83	.....	5·10	4·92	+4·40	4·11	.....	3·43
12 Eridani	6·03	6·27	5·62	4·85	.....	5·19	4·92	4·46	4·15	.....	3·66
16 "	6·47	5·76	6·03	5·03	.....	5·26	4·81	4·24	4·20	.....	3·62
ζ Tauri	6·39	6·05	5·52	5·27	.....	5·09	4·70	4·34	4·40	+3·83	3·35
17 Eridani	6·40	6·04	5·51	5·18	.....	5·09	4·97	4·06	4·39	3·93	3·27
ι "	6·28	6·03	5·60	5·23	.....	5·15	4·66	4·37	4·22	3·87	3·69
ζ "	6·62	6·08	5·34	5·43	.....	5·15	4·47	4·46	3·93	4·43	3·43
π "	6·24	7·03	4·42	5·29	.....	5·17	4·59	4·63	4·00		
β Reticuli											
Mean Rate for Stars	+6·36	+6·20	+5·43	+5·22	+5·31	+5·15	+4·73	+4·37	+4·19	+4·02	+3·56
Proportional part for $3^m 56^s$	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·01	0·01
Daily Rate by Stars	6·37	6·21	5·44	5·23	5·32	5·16	4·74	4·38	4·20	4·03	3·57
Mean Daily Rate by Sun and Stars	.....	+6·18	+5·48	+5·25	+5·43	+5·16	+4·76	+4·37	+4·22		

Copper and Iron Pendulums.—(Graham)

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APPENDIX. TABLE IV.—Porto Bello.

Porto Bello.

	DECEMBER, 1830.				JANUARY, 1831.						
	From 28 to 29.	From 29 to 30.	From 30 to 31. 29 to 31.	From 31 to 1.	From 30 to 3. 31 to 2. 31 to 3.	From 30 to 6. 2 to 3.	From 1 to 6. 2 to 4. 3 to 4.	From 3 to 5. 4 to 5.	From 5 to 6.	From 6 to 7.
Sun	.....	−101·84	−102·21	−102·14	.....	.....	−102·19	.....	.....	−102·13
54 Eridani	−101·89	−101·83	.....	.....	.....	−101·86				
μ "	102·40	101·93	.....	.....	−101·83	.....	.....	−102·02	−101·58	
63 "	101·80	102·09	101·65	.....	101·83	102·17	−101·42	102·32	101·48	
β "	102·40	102·07	101·64	.....	101·94	.....	101·93	101·34	102·08	
Rigel	101·71	102·06	102·06	.....	101·74	101·61	101·73	102·12	101·87	
λ Leporis	102·13	101·85	101·91	.....	101·98	101·19	.....	102·00	102·11	
ν Orionis	101·84	101·92	101·84	.....	101·89	.....	.....	101·64		
β Leporis	101·79	102·10	101·85	.....	101·72	.....	.....	102·06	101·56	
ι Orionis	102·17	101·70	102·01	.....	101·82	102·04	101·63	101·71	101·81	
ζ "	102·26	.....	101·79	.....	101·85	101·74	.....	101·93		
α Argus	.....	.....	102·59	.....	101·75	.....	101·66	102·10	101·36	
Mean Rate for Stars	−102·04	−101·95	−101·93	.....	−101·84	−101·77	−101·67	−101·92	−101·73	
Proportional part for $3^m\ 56^s$	0·28	0·28	0·28	.....	0·28	0·28	0·28	0·28	0·28	
Daily Rate by Stars	102·32	102·23	102·21	.....	102·12	102·05	101·95	102·20	102·01	
Mean Daily Rate by Sun and Stars	.....	−102·19	−102·21	−102·14	.....	.....	−101·99	.....	.....	−102·13

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TABLE V.—Details of the Experiments.

London (before the voyage).

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
				Pendulum	No. 10.						
		h m s	s	s	°	°	°	°		s	
1	Jan. 29	9 9 49	57	53·0	1·30		52·6		30·170	0·42	
		11 28 56	66	61·0	0·56		53·0		30·180		
2	Jan. 29	0 56 57	60	58·5	1·24		53·1		30·160	0·42	
		4 14 40	48	44·0	0·38		52·8		30·140		
3	Jan. 30	9 7 28	33	30·5	1·18		52·3		30·060	0·42	
		12 3 22	34	28·0	0·42		52·7		30·050		
4	Jan. 30	1 22 56	58	57·0	1·27		52·8		30·030	0·42	
		4 18 39	48	43·5	0·45		52·5		30·000		
5	Feb. 1	9 12 41	45	43·0	1·24		53·2		29·840	0·42	
		12 8 18	30	24·0	0·44		53·6		29·910		
6	Feb. 1	0 16 19	21	20·0	1·32		53·8		29·920	0·42	
		3 19 8	19	13·5	0·45		53·6		29·980		
7	Feb. 2	9 20 55	58	56·5	1·28		53·8		30·030	0·42	
		12 23 41	52	46·5	0·43		54·7		30·060		
8	Feb. 2	0 50 38	42	40·0	1·28		54·9		30·060	0·42	
		3 45 56	64	60·0	0·44		55·4		30·050		
				Pendulum	No. 11.						
1	Jan. 23	8 41 50	55	52·5	1·38		55·2		30·190	0·42	
		12 0 2	17	9·5	0·40		55·5		30·230		
2	Jan. 23	12 41 32	37	34·5	1·28		55·7		30·230	0·42	
		3 39 58	65	61·5	0·43		55·4		30·220		
3	Jan. 24	8 58 25	27	26·0	1·37		55·0		30·310	0·42	
		12 6 41	58	49·5	0·41		55·0		30·300		
4	Jan. 25	8 50 8	12	10·0	1·25		55·5		30·140	0·42	
		11 58 29	47	38·0	0·38		55·5		30·100		
5	Jan. 25	0 33 35	39	37·0	1·35		55·7		30·100	0·42	
		3 31 49	66	57·5	0·46		55·2		30·080		
6	Jan. 26	8 46 46	51	48·5	1·25		54·5		30·150	0·42	
		11 55 21	37	29·0	0·39		55·0		30·210		
7	Jan. 26	0 46 35	40	37·5	1·06		55·7		30·220	0·42	
		3 55 4	20	12·0	0·35		54·9		30·250		

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APPENDIX. TABLE V.—London (before the voyage).

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
				Iron Pe	ndulum	(Knife	edge	A.)			
		h m s	s	s	s	°	°	°		s	
1	Mar. 21	8 30 50	51	50·5	1·83	49·3	49·6	49·5	29·120	1·46	
		11 1 46	54	50·0	0·49	49·8	49·8	49·8	29·120		
2	Mar. 21	4 44 54	58	56·0	1·78	50·5	50·5	50·5	29·080	1·46	
		6 45 6	20	13·0	0·58	50·5	50·5	50·5	29·080		
3	Mar. 21	6 48 46	48	47·0	1·78	50·5	50·5	50·5	29·080	1·46	
		11 21 44	59	51·5	0·19	49·0	49·0	49·0	29·080		
4	Mar. 22	1 14 10	11	10·5	1·75	48·8	49·0	48·8	29·300	1·67	
		2 44 13	18	15·5	0·75	48·9	49·0	49·0	29·300		
5	Mar. 22	2 47 11	13	12·0	1·80	48·9	49·0	49·0	29·300	1·67	
		6 18 42	64	53·0	0·29	48·8	48·8	48·8	29·300		
6	Mar. 23	10 33 25	26	25·5	1·79	44·6	44·9	44·9	29·440	1·70	
		1 20 43	51	47·0	0·42	46·0	46·0	46·0	29·440		
7	Mar. 24	7 40 31	33	32·0	1·80	44·0	44·1	44·1	29·630	1·50	
		9 57 24	31	27·5	0·51	45·0	45·0	45·0	29·630		
8	Mar. 24	8 31 3	5	4·0	1·81	47·0	46·5	46·5	29·750	1·50	
		10 47 48	61	54·5	0·52	..	45·5	..	29·750		
				(Knife	edge	B.)					
1	Mar. 21	11 14 53	55	54·0	1·82	50·0	50·0	50·0	29·100	1·46	
		1 0 11	16	13·5	0·70	50·0	50·0	50·0	29·100		
2	Mar. 21	1 2 27	29	28·0	1·83	50·5	50·5	50·5	29·100	1·46	
		4 34 0	13	6·5	0·32	50·5	50·5	50·5	29·100		
3	Mar. 22	7 33 17	19	18·0	1·83	47·0	47·0	47·0	29·270	1·67	
		10 20 21	29	25·0	0·41	47·5	47·6	47·7	29·270		
4	Mar. 22	10 37 41	43	42·0	1·77	48·8	48·5	48·4	29·310	1·67	
		12 53 41	52	46·5	0·53	49·0	49·0	49·0	29·310		
5	Mar. 22	6 26 33	35	34·0	1·83	49·0	49·0	48·8	29·300	1·67	
		12 18 8	23	15·5	0·11	46·5	46·7	46·5	29·300		
6	Mar. 23	7 50 53	57	55·0	1·78	44·0	44·7	44·5	29·420	1·70	
		10 23 41	47	44·0	0·43	44·6	44·9	44·9	29·420		
7	Mar. 24	10 4 51	53	52·0	1·84	45·0	45·0	45·0	29·660	1·50	
		1 22 37	47	42·0	0·33	46·0	46·0	46·0	29·660		
8	Mar. 24	1 25 23	25	24·0	1·83	46·3	46·1	46·1	29·710	1·50	
		5 13 26	35	30·5	0·26	46·9	46·5	46·5	29·710		

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Appendix. Table V.—London (before the voyage).

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
			Copper Pendulum			(Knife edge A.)					
		h m s	s	s	°	°	°	°		s	
1	Mar. 19	6 17 22	25	23·5	1·81	55·0	54·8	55·0	29·570	1·05	
		8 5 53	59	56·0	0·71	54·5	54·7	55·0	29·570		
2	Mar. 19	3 45 34	36	35·0	1·80	54·7	54·7	54·7	29·540	1·05	
		6 21 11	21	16·0	0·52	54·1	54·4	54·0	29·540		
3	Mar. 20	10 51 53	55	54·0	1·82	50·6	50·8	51·0	29·500	1·24	
		1 44 29	43	36·0	0·45	51·0	51·0	51·0	29·500		
4	Mar. 20	1 51 22	24	23·0	1·82	51·2	51·5	51·4	29·400	1·24	
		4 27 51	61	56·0	0·50	51·5	51·5	51·5	29·400		
5	Mar. 20	10 57 42	43	42·5	1·83	51·0	51·0	51·0	29·300	1·24	
		12 31 6	12	9·0	0·80	51·0	51·3	51·3	29·300		
				(Knife	edge	B.)					
1	Mar. 19	8 19 17	19	18·0	1·82	54·5	54·7	55·0	29·530	1·05	
		10 7 23	28	25·5	0·77	54·5	54·6	55·0	29·530		
2	Mar. 19	6 29 28	33	30·5	1·80	54·5	54·5	54·5	29·540	1·05	
		9 4 50	63	56·5	0·54	53·5	53·7	53·5	29·540		
3	Mar. 20	6 40 49	53	51·0	1·82	50·0	50·4	50·1	29·530	1·24	
		10 4 47	63	55·0	0·41	50·3	50·7	50·6	29·530		
4	Mar. 20	4 38 23	25	24·0	1·84	51·5	51·5	51·5	29·300	1·24	
		7 14 38	50	44·0	0·56	51·7	51·5	51·6	29·300		
5	Mar. 20	7 41 9	11	10·0	1·80	51·8	51·7	51·7	29·250	1·24	
		10 49 10	26	18·0	0·44	51·0	51·0	51·0	29·250		
				Greenwich.							
				Pendulum No. 10.							
1	Feb. 24	5 49 17	18	17·5	0·97	42·6	42·6	42·6	29·683	+6·54	
		8 22 4	10	7·0	0·40	46·0	46·0	46·2	29·724		
2	Feb. 24	8 28 35	36	35·5	0·96	46·0	46·0	46·4	29·724	6·54	
		11 0 55	62	58·5	0·40	48·4	48·4	48·8	29·738		
3	Feb. 25	5 17 15	18	16·5	0·99	49·4	49·4	49·6	29·776	6·54	
		7 49 4	10	7·0	0·40	50·0	50·0	50·5	29·788		
4	Feb. 25	8 22 12	13	12·5	0·97	51·0	51·0	51·3	29·792	6·54	
		10 53 52	58	55·0	0·39	50·4	50·4	50·6	29·800		

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APPENDIX. TABLE V.—Greenwich.

No.	1828.	Disappearance	Reap.	Coincid	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	
5	Feb. 26	4 22 50	51	50·5	0·96	49·4	49·4	49·5	29·946	6·54	
		6 54 42	46	44·0	0·38	50·8	50·8	51·4	29·948		
6	Feb. 26	8 7 31	33	32·0	0·97	51·4	51·4	51·6	29·940	6·54	
		10 39 0	6	3·0	0·39	52·0	52·3	52·5	29·940		
7	Feb. 27	4 40 0	3	1·5	0·97	49·4	49·4	49·5	30·036	6·54	
		7 11 48	52	50·0	0·40	51·0	51·2	51·4	30·044		
8	Feb. 27	*7 45 39	43	41·0	0·94	..	..	51·6	30·040	6·54	
		10 2 46	52	49·0	0·40	..	..	52·0	30·048		
9	Feb. 28	4 28 50	51	50·5	0·97	49·0	49·0	49·0	30·240	6·54	
		7 0 38	43	40·5	0·40	49·9	49·9	50·0	30·249		
10	Feb. 28	8 21 14	16	15·0	0·94	50·4	50·4	50·5	30·250	6·54	
		10 52 57	64	60·5	0·39	49·8	49·8	50·0	30·238		
				Pendulum No. 11.							
1	Feb. 18	5 37 55	58	56·5	0·88	..	36·4	..	29·312	6·54	
		7 47 7	16	11·5	0·41	..	40·0	..	29·292		
2	Feb. 18	8 39 11	14	12·5	0·88	..	44·4	..	29·294	6·54	
		10 57 1	12	6·5	0·39	..	44·5	..	29·250		
3	Feb. 19	4 25 32	36	34·0	0·93	38·6	38·6	38·6	29·240	6·54	
		6 43 56	64	60·0	0·41	43·2	43·2	43·8	29·271		
4	Feb. 19	8 16 32	35	33·5	0·91	45·0	45·0	45·2	29·270	6·54	
		10 33 53	63	58·0	0·40	46·8	46·8	47·5	29·286		
5	Feb. 20	4 39 9	12	10·5	0·95	42·4	42·4	42·4	29·234	6·54	
		6 56 47	55	51·0	0·41	46·8	46·8	47·5	29·219		
6	Feb. 20	8 9 34	37	35·5	0·91	49·9	49·9	50·8	29·200	6·54	
		10 25 59	68	63·5	0·40	49·4	49·4	50·4	29·171		
7	Feb. 21	4 25 5	8	6·5	0·89	41·8	41·8	41·8	28·951	6·54	
		6 42 57	65	61·0	0·38	45·4	45·3	45·4	28·966		
8	Feb. 21	7 43 34	36	35·0	0·93	45·8	45·8	46·0	28·952	6·54	
		10 15 31	40	35·5	0·38	47·6	47·6	47·8	28·929		
9	Feb. 22	4 48 44	46	45·0	0·93	42·0	42·0	42·0	28·929	6·54	
		7 6 39	46	42·5	0·41	45·8	45·8	46·0	28·982		
10	Feb. 22	8 7 7	9	8·0	0·91	46·9	46·9	47·2	28·976	6·54	
		10 24 29	38	33·5	0·40	46·3	46·2	46·4	28·984		

* In the original observation book the time of the first coincidence is stated to be $7^h\ 46^m\ 39^s$: but on comparing it with the subsequent ones, it is evident that an error of one minute has been committed; which I have here corrected.—B.

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Appendix. Table V.—Monte Video.

No.	1823.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
				Pendulum		No. 10.					
		h m s	s	s	°	°	°	°		s	°
1	Aug. 24	1 32 0	2	1·0	0·97	49·4	49·5	49·4	30·246	47·50	A =
		4 0 3	9	6·0	0·40	50·0	50·0	50·0	30·212	...	D =
2	Aug. 25	7 13 30	32	31·0	0·96	47·6	47·6	47·6	30·150	47·50	A = 48
		9 49 0	5	2·5	0·43	47·4	47·4	47·3	30·176	...	D = 45
3	Aug. 25	11 13 24	26	25·0	0·97	48·0	48·0	48·0	30·178	47·50	A = 48
		13 48 48	55	51·5	0·42	48·4	48·5	48·5	30·140	...	D = 45
4	Aug. 25	2 11 41	43	42·0	0·96	48·8	48·8	49·0	30·140	47·50	A = 49
		4 46 55	64	59·5	0 40	49·4	49·5	49·5	30·122	...	D = 48
5	Aug. 26	7 11 17	22	19·5	0·97	48·8	48·8	48·8	30·280	47·50	A = 48
		9 46 41	48	44·5	0·41	48·5	48·5	48·5	30·309	...	D = 47
6	Aug. 26	9 56 18	22	20·0	0·95	48·5	48·5	48·5	30·309	47·50	A = 49
		12 31 40	48	44·0	0·39	49·0	49·0	49·2	30·291	...	D = 47
7	Aug. 26	12 37 25	26	25·5	0·97	49·0	49·0	49·2	30·291	47·50	A = 50
		3 12 38	45	41·5	0·38	49·7	49·8	49·8	30·300	...	D = 49
8	Aug. 27	7 26 3	4	3·5	0·98	50·5	50·5	50·5	30·349	47·83	A = 52
		10 1 4	12	8·0	0·39	51·0	51·0	51·0	30·352	...	D = 49
9	Aug. 27	10 45 57	58	57·5	0·98	51·0	51·0	51·2	30·352	47·83	A = 53
		1 49 9	17	13·0	0·33	51·5	51·6	51·8	30·280	...	D = 51
10	Aug. 27	2 6 55	56	55·5	0·97	51·8	52·0	52·0	30·282	47·83	A = 57
		4 27 46	53	49·5	0·41	52·2	52·4	52·5	30·272	...	D = 52
11	Aug. 28	7 30 7	10	8·5	0·93	52·4	52·5	52·5	30·120	47·51	A = 52
		10 4 50	61	55·5	0·35	52·4	52·5	52·5	30·128	...	D = 52
12	Aug. 28	10 52 5	8	6·5	0·95	52·5	52·5	52·5	30·120	47·51	A =
		1 26 48	57	52·5	0·36	52·6	52 7	52·7	30·068	...	D = 52
13	Aug. 28	2 7 1	4	2·5	0·98	52·7	52·8	52·8	30·068	47·51	A = 53
		4 41 39	58	48·5	0·38	52·5	52·6	52·6	30·048	...	D = 51
14	Aug. 29	8 0 9	12	10·5	0·97	52·8	53·0	53·0	29·986	47·94	A = 53
		10 34 50	59	54·5	0·38	52·5	52·6	52·7	30·000	...	D = 52
15	Aug. 29	10 48 25	28	26·5	0·96	52·6	52·8	52·9	30·000	47·94	A = 53
		1 23 5	14	9·5	0·37	52·5	52·6	52·7	29·986	...	D = 52
16	Aug. 29	1 43 17	18	17·5	0·99	52·6	52·8	52·8	29·988	47·94	A = 52
		4 17 54	62	58·0	0·38	52·5	52·7	52·7	29·986	...	D = 51

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APPENDIX. TABLE V.—Monte Video.

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
17	Aug. 30	7 22 5	6	5·5	0·96	52·0	52·1	52·3	30·273	48·36	A =52
		9 56 55	64	59·5	0·38	52·0	52·2	52·2	30·334	...	D =51
18	Aug. 30	10 54 53	54	53·5	0·98	52·2	52·3	52·4	30·344	48·36	A =54
		1 29 32	40	36·0	0·37	52·6	52·8	52·9	30·342	...	D =52
19	Aug. 30	2 1 6	8	7·0	0·97	52·7	53·0	53·1	30·350	48·36	A =54
		4 35 42	51	46·5	0·38	53·4	53·5	53·6	30·350	...	D =51
20	Aug. 31	7 13 31	34	32·5	0·97	52·3	52·4	52·5	30·500	47·64	A =53
		9 48 25	34	29·5	0·39	52·0	52·2	52·4	30·499	...	D =50
21	Aug. 31	11 1 17	18	17·5	0·99	52·2	52·3	52·4	30·498	47·64	A =53
		1 36 11	20	15·5	0·39	52·8	52·9	53·0	30·468	...	D =50
22	Aug. 31	2 13 53	56	54·5	0·98	52·8	53·2	53·3	30·470	47·64	A =53
		4 48 38	47	42·5	0·38	53·8	54·1	54·2	30·450	...	D =52
23	Sept. 1	7 16 38	40	39·0	0·97	53·0	53·2	53·3	30·380	46·89	A =53
		9 51 18	25	21·5	0·38	52·9	53·0	53·2	30·382	...	D =51
24	Sept. 1	10 52 50	52	51·0	0·95	53·0	53·2	53·3	30·354	46·89	A =54
		1 27 28	35	31·5	0·37	53·6	53·8	53·9	30·284	...	D =53
25	Sept. 1	2 7 57	60	58·5	0 95	53·6	53·9	54·0	30·282	46·89	A =55
		4 42 22	31	26·5	0·37	54·5	54·6	54·8	30·238	...	D =53
				Pendulum No. 11.							
1	Sept. 3	7 20 42	45	43·5	1·03	55·0	55·0	55·0	30·010	47·56	A =55
		10 46 28	41	34·5	0·30	55·2	55·2	55·2	30·001	...	D =54
2	Sept. 3	11 8 8	11	9·5	1·05	55·4	55·5	55·5	30·001	47·56	A =56
		1 37 41	51	46·0	0·41	56·0	56·1	56·2	29·950	...	D =55
3	Sept. 3	2 9 48	51	49·5	0·96	56·2	56·5	56·6	29·918	47·56	A =57
		4 48 39	50	44·5	0·37	57·5	57·5	57·5	29·920	...	D =55
4	Sept. 4	7 30 10	13	11·5	0·97	56·5	56·5	56·5	29·750	47·05	A =57
		10 18 19	30	24·5	0·34	56·8	56·8	56·8	29·580	...	D =56
5	Sept. 4	11 3 14	17	15·5	0·96	56·8	56·8	57·1	29·592	47·05	A =58
		1 41 58	10	64·0	0·36	57·0	57·0	57·0	29·684	...	D =57
6	Sept. 4	2 10 52	55	53·5	0·99	57·3	57·1	57·3	29·642	47·05	A =58
		4 40 12	20	16·0	0·39	57·5	57·5	57·6	29·752	...	D =57
7	Sept. 5	7 22 44	47	45·5	0·99	55·5	55·5	55·6	29·946	46·49	A =56
		10 1 29	40	34·5	0·38	55·5	55·5	55·6	30·044	...	D =53

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Appendix. Table V.—Monte Video.

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
8	Sept. 5	10 35 51	55	53·0	0·98	55·5	55·5	55·6	30·060	46·49	A =57
		1 14·35	46	40·5	0·37	56·2	56·2	56·3	30·040	...	D =55
9	Sept. 5	2 5 58	61	59·5	0·96	56·0	56·2	56·4	30·032	46·49	A =57
		4 44 37	48	42·5	0·36	56·5	56·5	56·7	30·030	...	D =56
10	Sept. 6	7 32 38	41	39·5	0·96	54·4	54·4	54·5	30·132	46·53	A =54
		10 11 28	38	33·0	0·39	54·0	54·1	54·0	30·176	...	D =54
11	Sept. 6	10 42 44	46	45·0	0·98	54·0	54·0	54·0	30·180	46·53	A =56
		1 21 32	41	36·5	0·39	54·2	54·2	54·3	30·184	...	D =53
12	Sept. 6	2 5 16	19	17·5	0·96	54·0	54·2	54·2	30·180	46·53	A =56
		4 44 10	19	14·5	0·36	54·6	54·7	54·9	30·200	...	D =54
13	Sept. 7	7 23 40	43	41·5	0·99	51·8	51·8	52·0	30·300	46·53	A =52
		10 12 18	29	23·5	0·40	51·3	51·3	51·4	30·290	...	D =51
14	Sept. 7	10 17 30	32	31·0	0·98	51·4	51·5	51·5	30·290	46·53	A =53
		1 43 45	57	51·0	0·28	52·3	52·3	52·4	30·299	...	D =51
15	Sept. 7	2 12 22	23	22·5	1·02	52·5	52·8	53·0	30·214	46·53	A =53
		4 51 30	45	37·5	0·38	53·3	53·4	53·5	30·142	...	D =52

Staten Island.

Pendulum No. 10.

										+	
1	Nov. 3	1 10 26	29	27·5	0·90	54·5	54·0	53·0	29·970	36·81	A =55
		3 43 18	29	23·5	0·37	55·5	55·0	54·0	29·992	...	D =53
2	Nov. 3	4 22 46	49	47·5	0·93	55·5	55·2	54·7	29·979	36·81	A =52
		6 55 40	53	46·5	0·38	51·8	51·4	51·0	29·980	...	D =51
3	Nov. 4	6 29 29	31	30·0	0·93	43·5	43·4	43·5	29·913	36·81	A =44
		9 4 2	11	6·5	0·37	47·2	47·2	46·8	29·888	...	D =43
4	Nov. 4	9 18 51	53	52·0	0·92	47·5	47·5	47·4	29·888	36·81	A =49
		11 52 40	49	44·5	0·39	51·8	51·7	51·5	29·860	...	D =48
5	Nov. 4	1 6 10	13	11·5	0·96	53·5	53·2	52·6	29·829	36·81	A =55
		3 46 4	13	8·5	0·37	55·0	54·8	54·2	29·781	...	D =53
6	Nov. 4	4 19 59	62	60·5	0·98	55·2	54·9	54·2	29·772	36·81	A =56
		6 52 52	63	57·5	0·40	52·0	51·6	51·4	29·729	...	D =53
7	Nov. 5	6 30 44	48	46·0	0·96	46·0	45·9	45·9	29·480	35·92	A =47
		9 4 58	64	61·0	0·39	47·6	47·6	47·5	29·390	...	D =43

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APPENDIX. TABLE V.—Staten Island.

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
8	Nov. 5	9 14 20	22	21·0	0·96	48·2	48·2	47·9	29·390	35·92	A =50
		11 48 6	14	10·0	0·40	49·5	49·4	49·2	29·362	...	D =46
9	Nov. 5	1 5 43	46	44·5	0·99	50·9	50·8	50·4	29·346	35·92	A =53
		3 46 9	22	15·5	0·38	50·5	50·4	50·0	29·310	...	D =46
10	Nov. 5	4 19 31	34	32·5	0·96	51·4	51·2	50·9	29·300	35·92	A =53
		7 27 52	73	62·5	0·31	49·3	49·1	48·9	29·221	...	D =44
11	Nov. 6	6 38 48	51	49·5	0·96	45·4	45·4	45·4	29·089	36·55	A =48
		9 13 6	13	9·5	0·40	46·5	46·4	46·4	29·111	...	D =43
12	Nov. 6	9 21 25	27	26·0	0·97	47·0	46·8	46·7	29·111	36·55	A =48
		11 55 28	35	31·5	0·39	48·0	47·8	47·8	29·122	...	D =43
13	Nov. 6	1 11 14	16	15·0	0·98	48·6	48·5	48·4	29·110	36·55	A =50
		3 45 0	9	4·5	0·40	49·2	49·0	48·8	29·108	...	D =46
14	Nov. 6	4 10 25	27	26·0	0·99	49·4	49·3	49·2	29·106	36·55	A =51
		6 44 8	23	15·5	0·41	48·0	48·0	47·8	29·100	...	D =49
15	Nov. 7	6 47 15	17	16·0	0·95	44·5	44·5	44·5	29·060	36·57	A =44
		9 21 42	49	45·5	0·39	45·6	45·5	45·5	29·033	...	D =42
16	Nov. 7	9 27 53	54	53·5	0·99	46·0	46·0	45·8	29·033	36·57	A =48
		12 16 8	17	12·5	0·38	47·5	47·5	47·4	29·018	...	D =44
17	Nov. 7	0 48 34	36	35·0	0·98	48·0	47·8	47·0	29·006	36·57	A =50
		3 36 30	38	34·0	0·38	48·8	48·8	48·4	28·966	...	D =48
18	Nov. 7	3 45 26	27	26·5	0·98	49·0	49·0	48·8	28·966	36·57	A =52
		6 19 15	25	20·0	0·40	48·0	47·8	47·7	28·820	...	D =46
19	Nov. 8	6 37 1	4	2·5	0·97	43·7	43·7	43·7	28·610	36·58	A =44
		9 11 34	44	39·0	0·40	44·6	44·6	44·6	28·600	...	D =40
20	Nov. 8	9 16 34	37	35·5	0·98	45·0	45·0	45·0	28·600	36·58	A =46
		11 51 2	11	6·5	0·40	44·6	44·6	44·6	28·630	...	D =40
21	Nov. 8	1 1 49	51	50·0	0·98	45·4	45·4	45·2	28·682	36·58	A =46
		3 36 14	25	19·5	0·39	44·5	44·4	44·4	28·800	...	D =40
22	Nov. 8	3 47 55	58	56·5	1·00	45·2	45·0	45·0	28·798	36·58	A =46
		6 22 20	37	28·5	0·42	43·5	43·5	43·5	28·862	...	D =41
23	Nov. 9	6 34 27	29	28·0	1·00	41·0	41·0	41·0	28·808	36·38	A =41
		9 16 42	51	46·5	0·40	42·0	41·9	41·9	28·780	...	D =38
24	Nov. 9	1 44 58	60	59·0	0·97	45·0	45·0	45·0	28·701	36·38	A =47
		4 19 26	35	30·5	0·39	47·4	47·0	46·5	28·691	...	D =42

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Appendix. Table V.—Staten Island.

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
25	Nov. 10	9 12 10	13	11·5	0·98	44·4	44·4	44·4	28·922	36·18	A =46
		11 46 36	49	42·5	0·40	46·5	46·4	46·2	28·938	...	D =39
*26	Nov. 10	1 58 34	38	36·0	1·00	46·4	46·4	46·0	28·930	36·18	A =47
		4 32 56	9	62·5	0·42	45·5	45·5	45·4	28·910	...	D =43
					Second Series.						
27	Nov. 12	6 47 17	20	18·5	0·98	44·0	44·0	44·0	29·216	36·55	A =46
		9 28 50	57	53·5	0·39	47·0	46·9	46·8	29·164	...	D =43
28	Nov. 12	10 15 37	38	37·5	0·98	48·0	47·9	47·6	29·169	36·55	A =49
		12 49 34	41	37·5	0·41	50·0	50·0	49·5	29·140	...	D =43
29	Nov. 12	1 40 40	42	41·0	1·00	50·8	50·6	50·0	29·130	36·55	A =52
		4 14 2	11	6·5	0·40	54·0	53·5	52·6	29·100	...	D =47
30	Nov. 12	4 21 28	30	29·0	0·99	54·2	53·6	53·0	29·100	36·55	A =57
		7 1 34	45	39·5	0·40	52·5	52·4	51·8	29·130	...	D =48
31	Nov. 13	6 44 31	33	32·0	0·98	44·4	44·2	44·2	29·335	36·45	A =46
		9 25·58	65	61·5	0·39	48·5	48·4	47·6	29·366	...	D =40
32	Nov. 13	10 12 53	54	53·5	0·98	49·3	49·0	48·6	29·359	36·45	A =52
		12 46 46	53	49·5	0·40	49·6	49·5	49·0	29·337	...	D =47
33	Nov. 13	1 45 21	24	22·5	0·98	49·5	49·4	49·0	29·332	36·45	A =51
		4 25 56	67	61·5	0·39	52·5	52·2	51·8	29·335	...	D =46
34	Nov. 13	4 32 59	61	60·0	0·99	52·9	52·8	52·2	29·335	36·45	A =54
		7 6 24	33	28·5	0·40	50·2	50·0	49·7	29·302	...	D =48
35	Nov. 14	6 36 5	8	6·5	1·01	45·0	45·0	44·9	29·209	36·46	A =47
		9 10 22	31	26·5	0·42	49·0	48·8	48·2	29·223	...	D =44
36	Nov. 14	10 11 0	2	1·0	0·98	50·4	50·3	49·5	29·208	36·46	A =51
		12 44 46	55	50·5	0·40	49·6	49·5	49·2	29·275	...	D =43
37	Nov. 14	2 4 9	11	10·0	1·00	51·0	50·9	50·4	29·300	36·46	A =53
		4 37 43	52	47·5	0 41	50·3	50·2	49·8	29·289	...	D =46
38	Nov. 14	4 46 29	32	30·5	0·97	50·5	50·5	50·4	29·289	36·46	A =53
		7 20 12	21	16·5	0·39	48·5	48·4	48·2	29·290	...	D =48

* The barometer used throughout these experiments, both at Monte Video and at Staten Island, was found, a few days ago, to be erroneously divided. Another barometer has therefore been substituted in the subsequent experiments.—F. From the comparison adduced by Captain Foster, it appears that the first barometer indicated the height of the mercury too small by 0·13 inch. The proper corrections are made for this error. See page 27.—B.

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APPENDIX. TABLE V.—Staten Island.

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
39	Nov. 15	8 48 39	41	40·0	0·97	45·0	45·0	45·0	29·096	36·32	A =45
		11 30 8	17	12·5	0·37	46·9	46·8	46·5	29·115	...	D =43
40	Nov. 15	1 12 54	56	55·0	0·95	46·5	46·5	46·3	29·157	36·32	A =47
		3 47 11	21	16·0	0·38	48·4	48·0	47·9	29·220	...	D =44
41	Nov. 15	4 32 29	30	29·5	0·97	48·4	48·4	48·2	29·248	36·32	A =48
		7 27 36	49	42·5	0·34	46·9	46·9	46·9	29·312	...	D =44
42	Nov. 16	6 48 31	33	32·0	0·98	41·5	41·5	41·5	29·419	36·64	A =43
		9 23 33	41	37·0	0·40	43·4	43·4	43·4	29·376	...	D =41
43	Nov. 16	9 27 53	55	54·0	0·98	43·5	43·5	43·5	29·376	36·64	A =44
		12 2 42	52	47·0	0·39	44·0	44·0	44·0	29·321	...	D =42
44	Nov. 16	1 29 1	4	2·5	0·99	44·0	44·0	44·0	29·234	36·64	A =45
		4 3 38	49	43·5	0·39	45·5	45·5	45·5	29·230	...	D =42
45	Nov. 17	6 59 15	16	15·5	0·97	40·5	40·5	40·5	29·249	36·50	A =40
		9 34 26	35	30·5	0·40	41·7	41·7	41·6	29·362	...	D =39
46	Nov. 17	10 28 20	22	21·0	0·98	42·0	42·0	42·0	29·376	36·50	A =43
		1 3 18	27	22·5	0·40	43·9	43·8	43·7	29·466	...	D =39
				Pendulum No. 11.							
1	Nov. 18	9 25 26	33	29·5	0·84	41·3	41·3	41·3	29·552	36·35	A =42
		11 56 28	42	35·0	0·34	43·0	43·0	42·9	29·520	...	D =39
2	Nov. 18	1 15 34	37	35·5	0·93	43·5	43·5	43·4	29·521	36·35	A =45
		4 33 0	19	9·5	0·28	45·6	45·5	45·5	29·524	...	D =39
3	Nov. 18	4 38 34	38	36·0	1·00	46·4	46·4	45·6	29·524	36·35	A =46
		*7 8 31	52	41·5	0·40	45·9	45·6	46·0	29·536	...	D =43
4	Nov. 22	6 43 55	59	57·0	0·96	43·5	43·5	43·5	30·046	36·22	A =44
		9 23 36	48	42·0	0·37	47·8	47·5	47·2	30·028	...	D =39
5	Nov. 22	10 19 27	30	28·5	0·98	48·5	48·5	48·0	30·022	36·22	A =52
		13 7 35	47	41·0	0·36	53·2	52·5	52·0	29·992	...	D =48
6	Nov. 22	2 9 51	54	52·5	1·00	54·2	53·7	53·0	29·980	36·22	A =56
		4 47 36	50	43·0	0·38	55·0	54·5	54·0	29·930	...	D =54
7	Nov. 22	4 55 3	7	5·0	0·97	54·5	54·4	53·6	29·924	36·22	A =56
		7 33 9	34	21·5	0·37	51·3	51·0	50·9	29·872	...	D =53

* In the original manuscript book this is $7^h\ 9^m\ 31^s$: but, on comparing it with the two preceding coincidences there given, it should evidently be $7^h\ 8^m\ 31^s$.—B.

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Appendix. Table V.—Staten Island.

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
8	Nov. 23	6 44 24	26	25·0	1·02	45·0	45·0	45·0	30·042	36·57	A =45
		9 23 55	65	60·0	0·39	49·2	49·0	48·6	30·089	...	D =39
9	Nov. 23	10 9 12	14	13·0	0·99	50·2	50·0	49·5	30·100	36·57	A =52
		12 47 31	43	37·0	0·37	54·5	54·3	53·5	30·126	...	D =47
10	Nov. 23	1 36 55	60	57·5	0·99	54·5	54·2	53·5	30·133	36·57	A =55
		4 14 54	67	60·5	0·37	53·4	53·0	52·5	30·143	...	D =50
11	Nov. 23	4 25 14	18	16·0	0·98	54·0	53·5	53·0	30·143	36·57	A =54
		7 3 17	31	24·0	0·37	52·4	52·0	51·6	30·146	...	D =50
12	Nov. 24	6 57 36	39	37·5	1·00	44·4	44·4	44·4	30·123	36·29	A =44
		9 37 21	32	26·5	0·39	48·0	48·0	47·5	30·121	...	D =42
13	Nov. 24	10 28 31	33	32·0	1·01	49·4	49·0	48·6	30·123	36·29	A =49
		1 7 6	16	11·0	0·38	52·9	52·5	51·9	30·136	...	D =46
14	Nov. 24	1 59 15	17	16·0	1·00	54·5	53·5	53·0	30·139	36·29	A =55
		4 36 57	72	64·5	0·38	54·0	54·2	53·5	30·130	...	D =50
15	Nov. 24	4 53 53	58	55·5	0·98	54·0	53·5	53·0	30·130	36·29	A =55
		7 31 55	68	61·5	0·38	51·4	51·0	50·6	30·130	...	D =51
16	Nov. 25	6 57 4	7	5·5	1·00	45·4	45·4	45·4	30·071	36·38	A =45
		9 36 49	62	55·5	0·37	46·0	46·0	45·9	30·025	...	D =41
17	Nov. 25	10 41 21	23	22·0	1·02	46·4	46·4	46·4	30·070	36·38	A =47
		1 21 11	24	17·5	0·38	47·8	47·7	47·5	29·964	...	D =43
18	Nov. 25	2 7 17	19	18·0	1·03	48·0	48·0	48·0	29·946	36·38	A =48
		4 47 17	30	23·5	0·38	47·6	47·6	47·6	29·880	...	D =45
19	Nov. 25	5 14 1	4	2·5	0·99	48·0	48·0	48·0	29·876	36·38	A =48
		7 54 9	34	21·5	0·37	47·0	47·0	47·0	29·801	...	D =43
20	Nov. 26	6 50 56	59	57·5	1·00	45·0	45·0	45·0	29·459	36·38	A =45
		9 31 3	14	8·5	0·37	48·0	47·9	47·8	29·486	...	D =42
21	Nov. 26	10 58 42	45	43·5	0·97	48·9	48·7	48·6	29·544	36·38	A =
		1 38 14	25	19·5	0·37	50·4	50·2	50·0	29·706	...	D =
22	Nov. 26	2 8 24	26	25·0	1·01	50·6	50·6	50·4	29·721	36·38	A =51
		4 47 52	63	57·5	0·38	49·9	49·8	49·5	29·850	...	D =47
23	Nov. 26	4 55 11	14	12·5	1·00	50·5	50·4	50·3	29·850	36·38	A =52
		7 34 45	57	51·0	0·37	49·0	49·0	48·8	29·946	...	D =47
24	Nov. 27	7 6 35	38	36·5	0·99	44·0	44·0	44·0	29·961	36·38	A =43
		9 47 10	20	15·0	0·37	46·2	46·0	45·9	29·880	...	D =40

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APPENDIX. TABLE V.—Staten Island.

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
25	Nov. 27	10 44 58	61	59·5	1·02	46·4	46·2	46·2	29·873	36·38	A =48
		1 34 37	49	43·0	0·36	47·4	47·4	47·0	29·832	...	D =43
26	Nov. 27	1 50 38	40	39·0	1·01	47·6	47·5	47·3	29·828	36·38	A =47
		4 40 0	14	7·0	0·36	48·0	48·0	47·6	29·748	...	D =45
				Iron Pendulum (Knife edge A.)							
1	Dec. 10	3 37 19	24	21·5	1·33	45·8	..	45·0	29·252	136·70	A =45
		6 4 40	58	49·0	0·43	48·5	..	47·0	29·229	...	D =44
2	Dec. 10	7 5 19	25	22·0	1·37	49·6	..	48·0	29·216	136·70	A =49
		9 32 40	65	52·5	0·43	50·6	..	49·1	29·195	...	D =47
3	Dec. 10	9 42 21	28	24·5	1·34	50·8	..	49·5	29·193	136·70	A =50
		12 19 10	46	28·0	0·38	50·2	..	49·0	29·150	...	D =48
4	Dec. 11	0 38 6	11	8·5	1·29	46·8	..	45·9	29·000	136·78	A =
		3 14 53	74	63·5	0·37	48·3	..	47·2	28·992	...	D =
5	Dec. 11	4 10 58	63	60·5	1·34	48·8	..	47·7	28·972	136·78	A =49
		6 47 45	61	53·0	0·38	50·3	..	49·2	28·919	...	D =45
6	Dec. 11	7 24 25	32	28·5	1·28	51·0	.	49·9	28·916	136·78	A =51
		10 1 17	38	27·5	0·33	53·3	..	51·9	28·872	...	D =47
7	Dec. 11	10 21 13	20	16·5	1·26	53·9	..	52·4	28·872	136·78	A =54
		12 58 23	51	37·0	0·34	53·0	..	51·4	28·850	...	D =51
8	Dec. 12	0 24 56	63	59·5	1·30	47·2	..	46·3	26·862	136·98	A =47
		3 11 11	37	24·0	0·33	47·9	..	47·0	28·961	...	D =43
9	Dec. 12	3 57 56	64	60·0	1·21	48·0	..	47·0	28·966	136·98	A =47
		6 35 5	32	18·5	0·33	47·3	..	46·5	29·050	...	D =45
10	Dec. 12	7 22 27	35	31·0	1·29	47·7	..	46·7	29·064	136·98	A =47
		9 59 44	70	57·0	0·35	47·0	..	46·2	29·147	...	D =44
11	Dec. 12	10 8 22	29	25·5	1·39	47·3	..	46·5	29·147	136·98	A =46
		12 45 27	64	45·5	0·35	46·8	..	46·0	29·223	...	D =44
				(Knife edge B.)							
1	Dec. 13	0 55 50	56	53·0	1·11	44·2	..	43·6	29·287	136·58	A =44
		3 32 57	75	66·0	0·30	46·0	..	45·2	29·271	...	D =40
2	Dec. 13	4 29 13	21	17·0	1·28	48·5	..	47·2	29·272	136·58	A =48
		7 6 7	24	15·5	0·35	49·0	..	48·0	29·324	...	D =47
3	Dec. 13	7 31 45	49	47·0	1·38	49·2	..	48·1	29·321	136·58	A =49
		10 17 53	70	61·5	0·33	49·9	..	48·7	29·359	...	D =47

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Appendix. Table V.—Staten Island.

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
4	Dec. 13	10 25 6	12	9·0	1·20	50·1	..	49·1	29·359	136·58	A =50
		13 1 59	88	73·5	0·33	49·6	..	48·3	29·364	...	D =48
5	Dec. 14	0 44 17	22	19·5	1·32	46·8	..	45·6	29·208	137·12	A =46
		3 21 3	20	11·5	0·37	48·0	..	47·0	29·232	...	D =45
6	Dec. 14	3 54 12	16	14·0	1·33	48·7	..	47·6	29·231	137·12	A =47
		6 31 1	14	7·5	0·37	48·0	..	47·0	29·256	...	D =45
7	Dec. 14	7 25 59	63	61·0	1·25	48·5	..	47·5	29·268	137·12	A =49
		10 2 46	62	54·0	0·34	49·8	..	48·5	29·276	...	D =47
8	Dec. 14	10 54 29	38	33·5	1·00	50·3	..	49·2	29·276	137·12	A =50
		1 31 18	54	36·0	0·28	49·0	..	47·9	29·260	...	D =48
9	Dec. 15	0 25 8	14	11·0	1·24	44·3	..	43·7	29·291	137·12	A =44
		3 2 5	22	13·5	0·34	45·0	..	44·6	29·317	...	D =43
10	Dec. 15	4 8 27	33	30·0	1·33	45·3	..	44·9	29·332	137·12	A =46
		6 45 15	37	26·0	0·37	46·3	..	45·4	29·356	...	D =44
11	Dec. 15	7 45 6	11	8·5	1·23	46·8	..	46·2	29·353	137·12	A =47
		10 12 44	60	52·0	0·37	48·6	..	47·3	29·370	...	D =43
12	Dec. 15	11 7 23	30	26·5	1·28	49·0	..	48·0	29·370	137·12	A =48
		13 44 15	38	26·5	0·34	47·8	..	46·8	29·376	...	D =47
			Copper Pendulum (Knife edge A).								
1	Dec. 2	11 50 46	51	48·5	1·33	43·0	..	42·8	29·330	137·35	A =43
		2 42 24	44	34·0	0·33	44·6	..	44·0	29·284	...	D =39
2	Dec. 2	3 31 12	19	15·5	1·35	45·8	..	44·8	29·290	137·35	A =46
		6 13 7	28	17·5	0·38	46·5	..	45·6	29·268	...	D =42
3	Dec. 2	6 50 14	21	17·5	1·33	46·5	..	45·9	29·246	137·35	A =46
		9 51 27	63	45·0	0·31	46·9	..	46·0	29·196	...	D =42
4	Dec. 2	10 3 48	59	53·5	1·39	47·2	..	46·5	29·196	137·35	A =47
		12 45 32	80	56·0	0·34	46·7	..	46·0	29·120	...	D =42
5	Dec. 3	12 33 10	17	13·5	1·42	43·8	..	43·2	29·056	138·08	A =44
		3 14 52	75	63·5	0·40	45·0	..	44·5	29·050	...	D =39
6	Dec. 3	4 3 16	26	21·0	1·37	45·3	..	44·9	29·066	138·08	A =47
		6 45 4	24	14·0	0·39	46·5	..	45·7	29·088	...	D =42
7	Dec. 3	6 54 20	29	24·5	1·37	46·5	..	45·8	29·088	138·08	A =46
		9 36 2	28	15·0	0·38	47·7	..	46·5	29·106	...	D =43

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APPENDIX. TABLE V.—Staten Island.

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
8	Dec. 3	9 50 33	40	36·5	1·31	48·2	..	47·0	29·108	138·08	A =48
		12 31 59	89	74·0	0·35	47·7	..	46·5	29·133	...	D =43
9	Dec. 7	0 37 33	42	37·5	1·20	42·4	..	42·0	29·574	137·52	A =42
		3 19 31	58	44·5	0·31	43·0	..	42·4	29·586	...	D =40
10	Dec. 7	3 31 46	53	49·5	1·28	43·1	..	42·7	29·584	137·52	A =43
		6 13 48	68	58·0	0·36	44·2	..	43·5	29·570	...	D =40
11	Dec. 7	7 1 38	44	41·0	1·37	44·7	..	44·0	29·556	137·52	A =45
		9 24 17	52	34·5	0·46	45·5	..	44·6	29·534	...	D =43
12	Dec. 7	10 35 9	18	13·5	1·36	46·0	..	45·0	29·534	137·52	A =47
		12 57 59	110	84·5	0·50	45·0	..	44·0	29·530	...	D =43
13	Dec. 8	0 43 25	32	28·5	1·40	43·0	..	42·6	29·446	137·75	A =43
		3 25 14	34	24·0	0·39	44·2	..	43·5	....	...	D =41
14	Dec. 8	3 54 36	42	39·0	1·28	44·5	..	43·7	29·450	137·75	A =44
		6 36 26	53	39·5	0·35	45·0	..	44·5	29·456	...	D =42
15	Dec. 8	6 58 39	47	43·0	1·30	45·4	..	44·7	29·460	137·75	A =44
		9 40 36	60	48·0	0·36	44·8	..	43·9	29·546	...	D =42
16	Dec. 8	9 48 41	46	43·5	1·38	44·9	..	44·1	29·546	137·75	A =45
		0 30 40	78	59·0	0·36	43·7	..	42·9	29·596	...	D =42
				(Knife	edge	B.)					
1	Dec. 4	1 40 38	45	41·5	1·33	43·5	..	43·0	29·427	137·14	A =42
		4 20 58	69	63·5	0·43	43·0	..	42·5	29·503	...	D =40
2	Dec. 4	4 39 36	44	40·0	1·33	43·3	..	43·0	29·503	137·14	A =43
		7 19 50	79	64·5	0·43	43·6	..	42·8	29·570	...	D =40
3	Dec. 4	7 28 31	41	36·0	1·28	43·8	..	43·0	29·570	137·14	A =43
		10 8 50	77	63·5	0·39	43·2	..	42·7	29·636	...	D =39
4	Dec. 4	10 15 17	26	21·5	1·36	43·5	..	42·8	29·642	137·14	A =43
		12 55 28	66	47·0	0·40	43·0	..	42·5	29·732	...	D =39
5	Dec. 5	0 44 53	62	57·5	1·26	41·8	..	41·3	29·796	137·45	A =41
		3 25 30	50	40·0	0·40	42·5	..	42·0	29·780	...	D =36
6	Dec. 5	4 19 53	61	57·0	1·36	42·9	..	42·5	29·775	137·45	A =43
		7 0 10	30	20·0	0·40	45·0	..	44·5	29·712	...	D =38
7	Dec. 5	7 38 58	66	62·0	1·13	45·9	..	45·0	29·711	137·45	A =46
		10 28 34	72	53·0	0·30	46·6	..	45·5	29·659	...	D =43

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Appendix. Table V.—Staten Island.

No.	1828.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
8	Dec. 5	10 42 27	37	32·0	1·27	46·6	..	45·6	29·658	137·45	A =46
		13 22 36	80	58·0	0·32	45·3	..	44·5	29·609	...	D =43
9	Dec. 6	0 46 13	18	15·5	1·38	42·3	..	41·8	29·448	137·29	A =42
		3 26 40	55	47·5	0·40	42·9	..	42·5	29·442	...	D =38
10	Dec. 6	3 39 22	25	23·5	1·29	43·0	..	42·6	29·443	137·29	A =44
		6 19 45	63	54·0	0·40	44·6	..	43·8	29·433	...	D =39
11	Dec. 6	6 31 10	16	13·0	1·20	44·8	..	44·0	29·433	137·29	A =45
		9 11 25	44	34·5	0·38	46·2	..	45·2	29·464	...	D =41
12	Dec. 6	9 22 25	32	28·5	1·31	46·5	..	45·7	29·472	137·29	A =47
		12 2 33	64	48·5	0·39	46·0	..	45·0	29·500	...	D =43
13	Dec. 9	1 13·35	42	38·5	1·29	40·8	..	40·1	29·621	136·49	A =39
		3 54 27	45	36·0	0·43	41·1	..	40·6	29·620	...	D =37
14	Dec. 9	4 28 0	7	3·5	1·29	41·6	..	41·0	29·620	136·49	A =41
		7 8 46	63	54·5	0·44	43·6	..	42·7	29·610	...	D =38
15	Dec. 9	7 43 11	16	13·5	1·31	44·0	..	43·2	29·600	136·49	A =44
		10 23 30	60	45·0	0·42	46·1	..	45·0	29·580	...	D =41
16	Dec. 9	10 32 10	17	13·5	1·31	46·1	..	45·0	29·580	136·49	A =47
		1 22 0	30	15·0	0·38	46·7	..	45·6	29·564	...	D =43

South Shetland.

	1829.				Pendulum No. 10.					+ -	
1	Feb. 2	11 43 24	25	24·5	0·94	36·8	36·7	36·7	29·578	79·69	A =37
		2 14 12	19	15·5	0·39	38·8	38·7	38·6	29·612	...	D =36
2	Feb. 2	2 20 34	35	34·5	0·95	39·0	38·8	38·8	29·612	79·69	A =38
		4 51 4	9	6·5	0·39	39·6	39·5	39·4	29·633	...	D =36
3	Feb. 2	4 59 17	18	17·5	0·90	40·2	40·2	39·8	29·633	79·69	A =38
		7 29 48	54	51·0	0·37	39·2	39·2	39·2	29·682	...	D =36
4	Feb. 3	8 49 4	5	4·5	0·90	34·8	34·8	34·8	29·770	80·39	A =34
		11 20 8	13	10·5	0·39	34·3	34·4	34·3	29·785	...	D =32
5	Feb. 3	11 27 19	20	19·5	0·89	34·8	34·8	34·8	29·785	80·39	A =34
		13 58 22	27	24·5	0·37	34·4	34·4	34·4	29·764	...	D =32
6	Feb. 3	2 7 0	1	0·5	0·91	34·9	34·9	34·9	29·764	80·39	A =34
		4 51 49	55	52·0	0·35	33·8	34·0	34·0	29·758	...	D =32

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APPENDIX. TABLE V.—South Shetland.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
7	Feb. 3	4 57 23	24	23·5	0·90	34·5	34·5	34·5	29·758	80·39	A =34
		7 55 55	63	59·0	0·32	33·5	33·5	33·5	29·764	...	D =30
8	Feb. 4	8 42 31	32	31·5	0·93	31·9	31·9	31·9	29·676	80·12	A =32
		11 13 52	57	54·5	0·39	32·6	32·5	32·5	29·669	...	D =28
9	Feb. 4	11 37 21	23	22·0	0·90	33·0	33·0	33·0	29·669	80·12	A =33
		14 8 38	43	40·5	0·38	34·5	34·5	34·5	29·652	...	D =31
10	Feb. 4	2 17 14	15	14·5	0·91	35·0	35·0	35·0	29·652	80·12	A =35
		5 15 38	43	40·5	0·35	36·6	36·6	36·6	29·644	...	D =32
11	Feb. 4	5 24 18	19	18·5	0·88	37·8	37·7	37·6	29·644	80·12	A =38
		8 1 55	62	58·5	0·36	36·4	36·4	36·4	29·650	...	D =36
12	Feb. 5	8 52 2	3	2·5	0·91	32·0	32·0	32·0	29·615	79·91	A =32
		11 23 16	21	18·5	0·38	33·3	33·4	33·4	29·603	...	D =29
13	Feb. 5	11 30 50	51	50·5	0·89	33·8	33·8	33·7	29·603	79·91	A =34
		*14 1 52	58	55·0	0·38	36·9	36·7	36·7	29·608	...	D =31
14	Feb. 5	2 13 11	12	11·5	0·90	37·5	37·4	37·3	29·608	79·91	A =
		4 43 42	48	45·0	0·38	40·0	39·8	39·8	29·618	...	D =
15	Feb. 5	4 49 28	29	28·5	0·89	41·2	41·0	40·7	29·618	79·91	A =40
		7 19 45	51	48·0	0·38	39·5	39·4	39·4	29·612	...	D =38
16	Feb. 6	8 55 55	56	55·5	0·95	34·3	34·3	34·3	29·588	79·70	A =35
		11 26 59	64	61·5	0·40	34·7	34·7	34·7	29·588	...	D =34
17	Feb. 6	11 40 13	14	13·5	0·93	35·2	35·2	35·2	29·588	79·70	A =36
		14 11 13	18	15·5	0·39	36·5	36·5	36·5	29·592	...	D =36
18	Feb. 6	2 26 17	19	18·0	0·93	37·0	37·0	37·0	29·592	79·70	A =37
		4 57 11	18	14·5	0·38	36·5	36·5	36·5	29·600	...	D =36
19	Feb. 6	5 5 19	21	20·0	0·88	37·7	37·5	37·5	29·600	79·70	A =37
		7 36 12	20	16·0	0·37	36·5	36·5	36·4	29·588	...	D =36
20	Feb. 7	8 25 30	31	30·5	0·90	34·0	34·0	34·0	29·528	79·70	A =33
		11 24 1	8	4·5	0·31	35·0	35·0	35·0	29·500	...	D =32
21	Feb. 7	11 41 2	3	2·5	0·92	35·5	35·5	35·5	29·500	79·70	A =35
		14 11 54	58	56·0	0·39	38·0	38·0	37·8	29·500	...	D =32
22	Feb. 7	2 24 31	32	31·5	0·89	39·0	39·0	38·6	29·500	79·70	A =37
		4 55 6	11	8·5	0·37	38·0	37·8	37·8	29·473	...	D =36

* In the original manuscript this is $14^h\ 2^m\ 52^s$: but the two coincidences which immediately precede it, evidently show that this is an error of the pen.—B.

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Appendix. Table V.—South Shetland.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
23	Feb. 7	5 3 27	28	27·5	0·89	38·5	38·4	38·4	29·473	79·70	A =38
		7 54 27	33	30·0	0·32	40·0	40·0	40·0	29·456	...	D =37
					Pendulum	No. 11.					
1	Jan. 18	10 42 22	26	24·0	0·87	43·6	43·5	43·3	29·632	78·80	A =43
		1 25 33	42	37·5	0·31	46·4	46·0	45·8	29·630	...	D =42
2	Jan. 18	2 41 38	41	39·5	0·87	47·0	46·9	46·7	29·628	78·80	A =47
		5 24 52	61	56·5	0·31	45·9	45·8	45·7	29·632	...	D =45
3	Jan. 18	6 15 52	54	53·0	0·91	45·8	45·7	45·6	29·640	78·80	A =46
		9 0 8	29	18·5	0·30	44·0	44·0	44·0	29·628	...	D =43
4	Jan. 19	8 13 36	39	37·5	0·94	39·0	38·9	38·9	29·618	78·80	A =38
		10 58 32	44	38·0	0·32	38·5	38·5	38·5	29·600	...	D =37
5	Jan. 19	11 9 42	46	44·0	0·92	39·4	39·3	39·2	29·600	78·80	A =38
		1 55 28	36	32·0	0·30	38·5	38·5	38·5	29·600	...	D =38
6	Jan. 19	2 19 29	32	30·5	0·93	39·5	39·5	39·5	29·604	78·80	A =39
		5 5 44	57	50·5	0·31	38·9	38·9	38·9	29·584	...	D =38
7	Jan. 19	5 16 45	50	47·5	0·93	39·9	39·9	39·7	29·584	78·80	A =39
		8 2 7	22	14·5	0·30	38·7	38·5	38·5	29·564	...	D =38
8	Jan. 20	5 17 25	29	27·0	0·93	36·5	36·5	36·5	29·485	78·80	A =35
		8 2 50	62	56·0	0·31	36·9	36·9	36·9	29·464	...	D =34
9	Jan. 20	8 11 30	34	32·0	0·98	37·2	37·0	37·0	29·464	78·80	A =36
		10 57 2	11	6·5	0·33	38·4	38·2	38·2	29·442	...	D =35
10	Jan. 20	11 7 42	44	43·0	0·91	39·0	38·8	38·8	29·442	78·80	A =38
		1 53 57	67	62·0	0·30	38·5	38·4	38·4	29·429	...	D =37
11	Jan. 20	2 6 52	54	53·0	0·98	39·4	39·3	39·2	29·429	78·80	A =39
		5 12 14	25	19·5	0·27	38·0	38·0	38·0	29·428	...	D =37
12	Jan. 20	5 21 12	14	13·0	0·93	38·9	38·8	38·7	29·428	78·80	A =38
		8 8 21	37	29·0	0·29	37·5	37·4	37·6	29·372	...	D =37
13	Jan. 21	5 29 17	19	18·0	0·96	35·7	35·5	35·5	29·270	78·81	A =34
		8 15 16	25	20·5	0·34	35·0	35·0	35·0	29·264	...	D =33
14	Jan. 21	8 24 47	50	48·5	0·95	35·8	35·8	35·7	29·264	78·81	A =35
		11 10 59	69	64·0	0·32	35·2	35·2	35·3	29·236	...	D =35
15	Jan. 21	11 19 11	13	12·0	0·96	36·2	36·2	36·2	29·236	78·81	A =35
		2 5 26	37	31·5	0·33	35·4	35·4	35·4	29·232	...	D =34

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APPENDIX. TABLE V.—South Shetland.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
16	Jan. 21	2 15 9	11	10·0	0·95	36·4	36·4	36·4	29·232	78·81	A =35
		5 1 30	41	35·5	0·32	35·4	35·4	35·4	29·216	...	D =35
17	Jan. 21	5 11 18	19	18·5	0·96	36·0	36·0	36·0	29·216	78·81	A =35
		7 57 48	59	53·5	0·31	35·0	35·0	35·0	29·200	...	D =35
18	Jan. 22	5 56 9	12	10·5	0·88	34·2	34·2	34·2	29·124	78·82	A =33
		8 52 13	25	19·0	0·26	34·6	34·6	34·6	29·100	...	D =33
19	Jan. 22	9 4 47	49	48·0	0·95	35·2	35·2	35·2	29·100	78·82	A =35
		11 51 39	50	44·5	0·31	34·4	34·4	34·4	29·079	...	D =35
20	Jan. 22	0 0 22	24	23·0	0·95	35·5	35·5	35·4	29·079	78·82	A =34
		2 47 42	51	46·5	0·30	34·6	34·6	34·6	29·068	...	D =34
21	Jan. 22	2 55 57	60	58·5	0·90	35·7	35·6	35·6	29·068	78·82	A =
		5 43 8	19	13·5	0·27	35·0	35·0	35·0	29·068	...	D=
22	Jan. 22	5 51 54	56	55·0	0·92	36·0	36·0	36·0	29·068	78·82	A =35
		8 48 34	49	41·5	0·29	34·6	34·6	34·6	29·076	...	D =34
23	Jan. 23	6 57 58	61	59·5	0·93	34·2	34·2	34·2	29·104	78·85	A =33
		9 46 12	23	17·5	0·29	35·0	35·0	35·0	29·106	...	D =33
24	Jan. 23	9 54 8	11	9·5	0·95	35·2	35·2	35·2	29·106	79·85	A =35
		12 33 58	67	62·5	0·30	35·7	35·7	35·7	29·108	...	D =35
25	Jan. 23	0 58 48	50	49·0	0·87	36·4	36·4	36·4	29·108	78·85	A =37
		3 49 13	23	18·0	0·24	37·6	37·6	37·6	29·140	...	D =36
26	Jan. 23	3 58 19	20	19·5	0·98	39·5	39·4	39·0	29·140	78·85	A =38
		6 49 5	22	13·5	0·27	37·5	37·5	37·5	29·158	...	D =37
27	Jan. 23	7 0 8	12	10·0	0·93	38·4	38·3	38·2	29·158	78·85	A =37
		9 32 24	73	48·5	0·29	36·6	36·4	36·4	29·172	...	D =36
28	Jan. 24	8 12 1	2	1·5	0·96	35·9	35·8	35·6	29·150	78·88	A =35
		10 57 41	50	45·5	0·33	34·5	34·5	34·5	29·130	...	D =34
29	Jan. 24	11 14 14	16	15·0	0·93	35·7	35·7	35·7	29·130	78·88	A =35
		2 9 0	10	5·0	0·30	35·3	35·3	35·3	29·134	...	D =34
30	Jan. 24	2 18 17	19	18·0	0·97	35·8	35·8	35·8	29·134	78·88	A =35
		5 3 48	58	53·0	0·34	36·8	36·8	36·7	29·163	...	D =34
31	Jan. 24	5 11 41	44	42·5	0·93	37·5	37·4	37·3	29·163	78·88	A =36
		8 15 46	63	54·5	0·27	36·5	36·5	36·4	29·160	...	D =35
32	Jan. 25	7 43 25	29	27·0	0·94	35·6	35·5	35·5	29·220	78·88	A =34
		10 28 31	41	36·0	0·34	36·5	36·5	36·4	29·234	...	D =32

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Appendix. Table V.—South Shetland.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
33	Jan. 25	10 36 51	52	51·5	0·99	36·7	36·7	36·5	29·234	78·88	A =37
		13 21 56	65	60·5	0·34	37·5	37·5	37·4	29·246	...	D =34
34	Jan. 25	1 30 6	10	8·0	0·92	38·2	38·2	38·0	29·246	78·88	A =38
		4 15 18	27	22·5	0·32	37·2	37·2	37·2	29·261	...	D =37
35	Jan. 25	4 21 15	18	16·5	0·97	37·8	37·8	37·7	29·261	78·88	A =37
		7 15 52	65	58·5	0·32	36·5	36·5	36·5	29·272	...	D =35
36	Jan. 26	8 6 1	4	2·5	0·98	33·5	33·5	33·5	29·308	78·87	A =33
		10 51 34	43	38·5	0·34	34·4	34·4	34·4	29·318	...	D =32
37	Jan. 26	11 4 39	41	40·0	0·97	34·5	34·5	34·5	29·318	78·87	A =34
		13 50 19	27	23·0	0·33	36·0	36·0	36·0	29·342	...	D =31
38	Jan. 26	1 57 26	28	27·0	0·97	36·9	36·9	36·9	29·342	78·87	A =38
		4 52 7	19	13·0	0·33	36·0	36·0	36·0	29·340	...	D =37
39	Jan. 26	5 1 54	58	56·0	0·89	37·6	37·6	37·6	29·340	78·87	A =38
		7 47 51	72	61·5	0·30	36·2	36·2	36·2	29·340	...	D =36
40	Jan. 27	8 4 37	40	38·5	0·93	33·7	33·8	33·8	29·360	78·87	A =32
		10 50 33	44	38·5	0·31	34·4	34·4	34·4	29·353	...	D =31
41	Jan. 27	10 59 2	4	3·0	0·94	34·6	34·6	34·6	29·353	78·87	A =34
		13 54 7	20	13·5	0·30	35·2	35·2	35·2	29·372	...	D =32
42	Jan. 27	2 4 53	56	54·5	0·97	35·8	35·8	35·8	29·372	78·87	A =34
		5 9 1	16	8·5	0·30	35·0	35·0	35·0	29·378	...	D =33
43	Jan. 27	5 18 1	4	2·5	0·93	35·8	35·8	35·8	29·378	78·87	A =
		8 3 37	56	46·5	0·32	35·0	35·0	35·0	29·378	...	D =
44	Jan. 28	8 3 55	57	56·0	0·94	34·5	34·0	34·0	29·381	78·89	A =33
		10 49 46	57	51·5	0·32	34·0	34·5	34·5	29·392	...	D =31
45	Jan. 28	10 59 45	47	46·0	0·97	34·7	34·7	34·7	29·392	78·89	A =34
		13 45 31	42	36·5	0·33	35·5	35·5	35·5	29·400	...	D =32
46	Jan. 28	2 2 53	55	54·0	0·96	36·0	36·0	36·0	29·400	78·89	A =35
		4 57 38	49	43·5	0·31	37·5	37·5	37·4	29·446	...	D =32
47	Jan. 28	6 1 3	6	4·5	0·88	37·5	37·5	37·5	29·446	78·89	A =36
		8 55 35	49	42·0	0·29	36·5	36·5	36·5	29·414	...	D =34
48	Jan. 29	8 15 37	39	38·0	0·97	35·0	35·0	34·8	29·413	78·92	A =34
		11 1 22	31	26·5	0·33	36·9	36·8	36·7	29·417	...	D =32
49	Jan. 29	11 8 53	55	54·0	0·97	37·2	37·2	37·2	29·417	78·92	A =38
		13 54 34	42	38·0	0·33	38·4	38·4	38·4	29·428	...	D =37

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APPENDIX. TABLE V.—South Shetland.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
50	Jan. 29	2 6 32	34	33·0	0·95	39·2	39·0	38·9	29·428	78·92	A =39
		4 52 10	18	14·0	0·33	38·5	38·4	38·4	29·428	...	D =37
51	Jan. 29	5 4 20	22	21·0	0·95	39·5	39·5	39·4	29·428	78·92	A =40
		7 40 43	54	48·5	0·33	38·4	38·4	38·0	29·441	...	D =37
52	Jan. 30	8 15 12	15	13·5	0·94	35·6	35·6	35·6	29·438	78·94	A =34
		11 1 7	17	12·0	0·32	34·7	34·7	34·7	29·450	...	D =33
53	Jan. 30	11 12 6	8	7·0	0·95	35·8	35·8	35·8	29·450	78·94	A =35
		13 58 7	17	12·0	0·30	35·0	35·0	35·0	29·464	...	D =35
54	Jan. 30	2 7 41	43	42·0	0·92	36·2	36·2	36·2	29·464	78·94	A =35
		4 53 50	63	56·5	0·30	35·0	35·0	35·0	29·476	...	D =35
55	Jan. 30	5 2 23	26	24·5	0·95	36·4	36·4	36·4	29·476	78·94	A =35
		7 57 45	60	52·5	0·29	35·4	35·4	35·4	29·500	...	D =34
56	Jan. 30	8 13 8	10	9·0	0·86	35·6	35·6	35·6	29·570	78·94	A =35
		10 59 1	14	7·5	0·29	36·8	36·8	36·7	29·573	...	D =33
57	Jan. 30	11 7 57	58	57·5	0·93	37·3	37·3	37·3	29·573	78·94	A =37
		13 53 33	44	38·5	0·31	37·8	37·8	37·8	29·570	...	D =35
58	Jan. 31	1 59 45	48	46·5	0·93	38·2	38·1	38·0	29·570	79·14	A =36
		4 45 11	24	17·5	0·32	37·4	37·4	37·4	29·574	...	D =35
59	Feb. 1	8 22 59	61	60·0	0·94	35·8	35·8	35·8	29·569	79·33	A =35
		11 8 47	57	52·0	0·32	35·0	35·0	35·0	29·562	...	D =34
60	Feb. 1	11 16 46	48	47·0	0·96	36·0	35·8	35·7	29·562	79·33	A =35
		14 2 30	40	35·0	0·32	38·4	38·2	37·8	29·564	...	D =34
61	Feb. 1	2 10 41	42	41·5	0·98	39·8	39·7	39·5	29·564	79·33	A =38
		4 55 47	61	54·0	0·33	38·4	38·4	38·3	29·566	...	D =37
62	Feb. 1	5 4 56	60	58·0	0·31	38·4	38·4	38·4	29·566	79·33	A =39
		7 50 2	13	7·5	0·90	40·4	40·1	39·8	29·564	...	D =37
				Iron Pe	ndulum	(Knife	edge	A).		+	
1	Feb. 9	0 20 16	23	19·5	1·12	42·0	..	41·5	29·413	160·94	A =44
		3 10 25	56	40·5	0·23	43·5	..	42·6	29·428	...	D =42
2	Feb. 9	3 36 50	57	53·5	1·10	44·2	..	43·5	29·428	160·94	A =44
		6 17 27	72	49·5	0·29	43·0	..	41·8	29·433	...	D =42
3	Feb. 10	7 5 5	14	9·5	1·08	37·0	..	36·5	29·462	160·38	A =37
		9 46 5	35	20·0	0·30	38·2	..	37·8	29·481	...	D =36

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Appendix. Table V.—South Shetland.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
4	Feb. 10	9 55 44	51	47·5	1·20	38·3	..	38·1	29·481	160·38	A =38
		12 36 35	65	50·0	0·32	39·6	..	39·0	29·500	...	D =37
5	Feb. 10	0 56 44	55	49·5	1·01	39·8	..	39·5	29·500	160·38	A =40
		3 47 13	50	31·5	0·24	39·0	..	38·4	29·566	...	D =38
6	Feb. 11	6 23 52	61	56·5	1·08	36·7	..	36·3	29·549	159·81	A =36
		9 4 37	67	52·0	0·25	37·6	..	37·0	29·549	...	D =34
7	Feb. 11	9 50 52	61	56·5	1·08	38·2	..	37·7	29·549	159·81	A =38
		12 31 38	84	61·0	0·27	39·2	..	38·7	29·544	...	D =35
8	Feb. 11	0 54 6	13	9·5	1·15	39·5	..	39·0	29·544	159·81	A =40
		3 34 41	85	63·0	0·29	41·2	..	40·4	29·545	...	D =38
9	Feb. 11	3 46 21	28	24·5	1·18	41·4	..	41·0	29·545	159·81	A =41
		6 36 13	69	41·0	0·26	41·9	..	40·7	29·544	...	D =39
10	Feb. 12	6 52 47	57	52·0	1·11	38·2	..	37·6	29·518	161·85	A =38
		9 33 20	57	38·5	0·29	39·1	..	38·7	29·508	...	D =35
11	Feb. 12	9 42 33	40	36·5	1·14	39·2	..	38·8	29·508	161·85	A =40
		12 32 23	67	45·0	0·28	40·4	..	39·8	29·500	...	D =38
12	Feb. 12	0 41 11	18	14·5	1·19	40·5	..	39·8	29·500	161·85	A =40
		3 40 35	77	56·0	0·25	41·0	..	40·2	29·475	...	D =38
13	Feb. 18	7 28 16	26	21·0	1·06	37·8	..	37·5	29·159	161·30	A =39
		10 8 34	77	55·5	0·28	38·7	..	38·0	29·056	...	D =38
14	Feb. 18	10 29 19	28	23·5	1·17	38·8	..	38·0	29·052	161·30	A =38
		13 10 2	43	22·5	0·30	39·4	..	38·8	28·960	...	D =38
15	Feb. 18	1 20 49	56	52·5	1·21	39·6	..	38·9	28·956	161·30	A =40
		4 10 58	101	79·5	0·28	40·0	..	39·1	28·944	...	D =38
				(Knife	edge	B.)					
1	Feb. 13	13 33 1	10	5·5	1·09	38·0	..	37·6	29·560	161·58	A =37
		13 13 52	85	68·5	0·31	40·0	..	39·4	29·592	...	D =36
2	Feb. 13	1 34 27	35	31·0	1·05	40·2	..	39·8	29·592	161·58	A =40
		4 15 26	63	44·5	0·28	42·8	..	42·0	29·624	...	D =38
3	Feb. 14	7 0 31	36	33·5	1·22	37·1	..	36·5	29·488	161·30	A =36
		9 41 17	57	37·0	0·30	37·8	..	37·5	29·447	...	D =33
4	Feb. 14	9 56 27	37	32·0	1·05	37·8	..	37·2	29·447	161·30	A =37
		12 37 16	61	38·5	0·30	38·3	..	37·8	29·404	...	D =36

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APPENDIX. TABLE V.—South Shetland.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers.			Barometer.	Rate. +	Hygrom.
						Upper.	Middle.	Lower.			
		h m s	s	s	°	°	°	°		s	°
5	Feb. 14	0 49 42	49	45·5	1·22	38·3	..	38·0	29·400	161·30	A =37
		3 39 59	107	83·0	0·30	38·8	..	38·2	29·361	...	D =36
6	Feb. 15	7 15 15	22	18·5	1·16	37·4	..	36·8	29·250	161·03	A =37
		9 56 11	51	31·0	0·31	38·7	..	38·0	29·257	...	D =35
7	Feb. 15	10 7 42	49	45·5	1·20	38·9	..	38·2	29·260	161·03	A =38
		12 48 36	71	53·5	0·31	39·8	..	39·1	29·256	..	D =37
8	Feb. 15	0 58 30	37	33·5	1·18	40·0	..	39·2	29·256	161·03	A =40
		3 39 29	69	49·0	0·30	40·6	..	39·8	29·262	...	D =39
9	Feb. 15	3 57 30	42	36·0	1·06	41·0	..	40·1	29·262	161·03	A =40
		6 19 30	92	61·0	0·32	40·4	..	39·6	29·256	...	D =39
10	Feb. 16	7 16 3	9	6·0	1·20	38·2	..	37·8	29·242	161·12	A =38
		9 57 2	35	18·5	0·31	38·9	..	38·3	29·236	...	D =37
11	Feb. 16	10 4 27	33	30·0	1·20	38·9	..	38·3	29·236	161·12	A =40
		12 45 23	58	40·5	0·32	39·9	..	39·3	29·250	...	D =37
12	Feb. 16	0 58 37	43	40·0	1·05	40·0	..	39·6	29·250	161·12	A =39
		3 39 42	87	64·5	0·29	40·0	..	39·2	29·250	...	D =37
13	Feb. 16	3 48 19	28	23·5	1·20	40·0	..	39·5	29·250	161·12	A =40
		6 19 50	100	75·0	0·36	40·0	..	38·6	29·250	...	D =37
14	Feb. 17	6 58 44	52	48·0	1·22	37·7	..	37·6	29·311	161·21	A =37
		9 49 2	46	24·0	0·32	38·0	..	37·0	29·331	...	D =35
15	Feb. 17	9 59 9	16	12·5	1·22	38·0	..	37·5	29·331	161·21	A =38
		12 40 5	43	24·0	0·35	38·8	..	38·0	29·362	...	D =35
16	Feb. 17	1 12 4	15	9·5	1·12	39·0	..	38·6	29·362	161·21	A =38
		3 53 3	47	25·0	0·34	39·8	..	39·0	29·381		D =36
			Copper Pendulum (Knife edge A).								
1	Feb. 19	10 50 45	52	48·5	1·24	39·0	..	38·2	28·800	161·39	A =38
		13 26 23	57	40·0	0·38	39·5	..	38·8	28·779	...	D =38
2	Feb. 19	1 46 1	12	6·5	1·07	40·0	..	39·2	28·779	161·39	A =38
		5 10 34	91	62·5	0·22	39·7	..	38·8	28·700	...	D =37
3	Feb. 20	8 5 49	59	54·0	1·09	35·1	..	35·0	28·505	161·57	A =34
		11 1 43	83	63·0	0·29	35·0	..	34·7	28·550	...	D =34
4	Feb. 20	11 18 18	29	23·5	1·16	35·2	..	35·0	28·552	161·57	A =34
		2 4 24	61	42·5	0·34	35·6	..	34·8	28·608	...	D =34

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Appendix. *Table V.—South Shetland.*

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
5	Feb. 20	2 12 20	30	25·0	1·27	35·4	..	35·2	28·610	161·57	A =35
		5 7 56	95	75·5	0·33	36·0	..	35·4	28·700	...	D =34
6	Feb. 21	7 56 13	20	16·5	1·11	34·8	..	34·5	29·124	161·75	A =34
		10 42 14	49	31·5	0·28	36·0	..	35·8	29·200	...	D =34
7	Feb. 21	10 51 35	46	40·5	1·10	36·1	..	35·9	29·200	161·75	A =36
		13 37 28	63	45·5	0·29	38·1	..	37·8	29·259	..	D =35
8	Feb. 21	1 46 1	9	5·0	1·06	38·2	..	37·9	29·259	161·75	A =38
		4 31 41	81	61·0	0·26	39·2	..	38·6	29·330	...	D =35
9	Feb. 25	1 14 30	39	34·5	1·20	39·0	..	38·5	29·500	161·68	A =40
		4 0 3	49	26·0	0·35	40·0	..	39·0	29·479	...	D =40
				(Knife	edge	B.)					
1	Feb. 22	7 27 36	50	43·0	1·07	36·0	..	35·5	29·474	161·93	A =35
		10 12 34	71	52·5	0·34	37·2	..	36·8	29·482	...	D =34
2	Feb. 22	10 39 57	66	61·5	1·17	37·3	..	37·0	29·482	161·93	A =37
		13 34 24	59	41·5	0·35	39·2	..	38·7	29·468	...	D =36
3	Feb. 22	1 52 9	19	14·0	0·94	39·2	..	38·9	29·468	161·93	A =39
		4 37 8	51	29·5	0·30	40·5	..	39·8	29·450	...	D =39
4	Feb. 23	7 14 28	37	32·5	1·20	38·0	..	37·8	29·265	161·81	A =38
		9 59 2	38	20·0	0·38	39·0	..	38·2	29·260	...	D =37
5	Feb. 23	10 6 21	29	25·0	1·14	38·7	..	38·3	29·260	161·81	A =39
		12 50 49	84	66·5	0·37	40·3	..	40·0	29·254	...	D =37
6	Feb. 23	1 8 13	21	17·0	1·11	40·8	..	40·2	29·254	161·81	A =40
		3 52 44	86	65·0	0·37	41·4	..	41·0	29·250	...	D =39
7	Feb. 24	7 31 19	30	24·5	1·11	36·0	..	35·5	29·286	161·68	A =36
		10 6 45	84	64·5	0·38	35·8	..	35·2	29·285	...	D =36
8	Feb. 24	10 15 17	28	22·5	1·11	36·0	..	35·4	29·285	161·68	A =37
		13 19 42	97	69·5	0·30	36·2	..	35·8	29·290	...	D =37
9	Feb. 24	1 28 49	57	53·0	1·16	36·2	..	35·8	29·290	161·68	A =37
		4 23 35	81	58·0	0·35	37·2	..	36·7	29·278	...	D =37
10	Feb. 25	7 17 33	43	38·0	1·11	36·3	..	35·8	29·438	161·68	A =37
		10 31 38	85	61·5	0·31	37·6	..	37·2	29·469	...	D =36

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APPENDIX. TABLE V.—Cape Horn.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
				Pendulum		No. 10.					
		h m s	s	ss	°	°	°	°		s	°
1	April 29	8 0 56	59	57·5	0·92	39·5	39·5	39·6	29·692	45·27	A =39
		10 34 1	6	3·5	0·40	38·8	38·8	38·8	29·706	...	D =39
2	April 30	8 32 53	57	55·0	0·92	41·6	41·6	41·6	29·348	45·29	A =42
		11 40 37	45	41·0	0·30	42·0	42·0	42·0	29·344	...	D =41
3	April 30	11 44 33	35	34·0	0·90	42·0	42·0	42·0	29·350	45·29	A =43
		3 6 8	17	12·5	0·28	42·3	42·3	42·3	29·308	...	D =42
4	May 1	8 11 50	53	51·5	0·91	40·9	40·9	41·2	29·149	45·29	A =41
		11 26 40	49	44·5	0·30	40·4	40·4	40·3	29·156	...	D =39
5	May 1	11 36 38	39	38·5	0·90	40·6	40·6	40·6	29·156	45·29	A =41
		14 51 28	35	31·5	0·29	41·4	41·4	41·3	29·181	...	D =39
6	May 2	8 16 51	53	52·0	0·94	37·8	37·8	37·8	29·358	45·14	A =37
		11 46 10	15	12·5	0·31	37·4	37·4	37·4	29·364	...	D =35
7	May 2	0 10 53	55	54·0	0·92	38·0	38·0	38·0	29·372	45·14	A =38
		3 33 15	24	19·5	0·30	37·3	37·3	37·3	29·468	...	D =36
8	May 3	8 50 3	6	4·5	0·94	39·4	39·4	39·4	29·472	45·60	A =39
		12 33 7	18	12·5	0·26	40·4	40·4	40·4	29·331	...	D =39
9	May 3	0 41 52	54	53·0	0·94	41·0	40·8	40·9	29·331	45·60	A =41
		3 35 49	62	55·5	0·32	41·4	41·4	41·4	29·262	...	D =41
10	May 4	8 37 25	30	27·5	0·92	38·0	38·0	38·0	29·420	45·60	A =37
		12 13 44	51	47·5	0·28	37·5	37·5	37·5	29·432	...	D =37
11	May 4	0 26 37	38	37·5	0·91	38·0	38·0	38·2	29·432	45·60	A =37
		3 35 2	9	5·5	0·30	37·7	37·7	37·7	29·424	...	D =37
12	May 5	8 56 23	25	24·0	0·94	37·0	37·0	37·2	29·588	45·17	A =35
		12 46 51	57	54·0	0·27	36·7	36·7	36·7	29·614	...	D =35
13	May 5	0 53 54	55	54·5	0·95	37·4	37·4	37·4	29·614	45·17	A =37
		3 41 29	36	32·5	0·36	37·0	37·0	37·2	29·623	...	D =36
14	May 6	8 28 0	3	1·5	0·93	38·9	38·9	38·9	29·381	45·17	A =39
		11 50 8	20	14·0	0·28	40·1	40·0	40·0	29·264	...	D =39
15	May 6	0 1 27	30	28·5	0·94	40·4	40·4	40·4	29·268	45·17	A =40
		3 23 21	38	29·5	0·28	40·7	40·7	40·7	29·140	...	D =40
16	May 7	8 39 59	60	59·5	0·91	37·4	37·4	37·5	29·400	45·17	A =37
		12 2 28	34	31·0	0·30	37·2	37·2	37·2	29·416	...	D =37

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Appendix. Table V.—Cape Horn.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
17	May 7	0 10 29	30	29·5	0·92	37·2	37·2	37·3	29·400	45·17	A =38
		3 53 50	66	58·0	0·28	37·8	37·8	37·8	29·433	...	D =37
18	May 8	8 31 54	57	55·5	0·92	37·7	37·7	37·9	29·061	45·17	A =38
		11 54 11	25	18·0	0·28	39·7	39·7	39·7	29·100	...	D =38
19	May 8	0 11 24	26	25·0	0·94	40·0	40·1	40·1	29·100	45·17	A =40
		3 33 20	35	27·5	0·28	40·6	40·6	40·5	29·173	...	D =39
20	May 9	8 50 34	36	35·0	0·89	40·0	40·0	40·0	29·324	45·17	A =40
		12 5 41	48	44·5	0·28	40·4	40·4	40·4	29·364	...	D =39
21	May 9	0 22 58	59	58·5	0·92	41·0	41·0	41·0	29·371	45·17	A =42
		3 44 52	63	57·5	0·28	40·4	40·4	40·4	29·501	...	D =41
22	May 10	9 31 53	55	54·0	0·92	40·6	40·6	40·6	29·261	45·17	A =41
		12 53 48	57	52·5	0·28	41·6	41·6	41·6	29·162	...	D =40
				Pendulum No. 11.							
1	April 15	0 39 53	56	54·5	0·91	41·5	41·5	41·5	29·848	45·03	A =41
		3 17 56	70	63·0	0·33	41·4	41·3	41·2	29·800	...	D =38
2	April 17	7 59 31	33	32·0	0·93	38·9	38·9	39·0	29·804	45·19	A =38
		10 37 35	42	38·5	0·39	38·5	38·5	38·6	29·786	...	D =37
3	April 17	10 55 43	45	44·0	0·92	39·2	39·2	39·4	29·792	45·19	A =39
		13 5 55	63	59·0	0·42	39·0	39·0	39·1	29·812	...	D =38
4	April 19	0 48 3	6	4·5	0·93	44·7	44·5	44·4	29·781	45·14	A =45
		3 25 12	19	15·5	0·35	43·4	43·4	43·4	29·755	...	D =44
5	April 20	7 29 24	25	24·5	0·95	38·6	38·6	38·7	29·535	45·12	A =39
		10 7 34	43	38·5	0·38	38·9	38·9	39·0	29·500	...	D =37
6	April 20	10 18 19	22	20·5	0·92	39·0	39·1	39·2	29·495	45·12	A =39
		12 56 36	44	40·0	0·35	40·2	40·2	40·2	29·422	...	D =38
7	April 20	1 4 40	43	41·5	0·92	40·5	40·5	40·5	29·416	45·12	A =41
		3 42 48	56	52·0	0·36	41·6	41·6	41·6	29·392	...	D =40
8	April 21	7 26 6	10	8·0	0·92	41·0	40·9	41·0	29·761	45·22	A =41
		10 3 56	65	60·5	0·35	40·5	40·5	40·5	29·791	...	D =40
9	April 21	10 19 31	33	32·0	0·91	40·9	40·9	40·9	29·792	45·22	A =41
		12 57 18	27	22·5	0·33	41·9	41·8	41·8	29·804	...	D =39
10	April 21	1 5 58	59	58·5	0·92	42·4	42·4	42·4	29·792	45·22	A =
		3 43 36	43	39·5	0·35	41·6	41·6	41·6	29·767	...	D =

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APPENDIX. TABLE V.—Cape Horn.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
11	April 22	7 51 10	13	11·5	0·91	42·5	42·5	42·4	29·250	45·39	A =43
		10 28 39	50	44·5	0·35	43·8	43·5	43·6	29·212	...	D =42
12	April 22	10 41 57	60	58·5	0·90	44·3	43·9	43·9	29·212	45·39	A =45
		1 19 26	33	29·5	0·34	44·9	44·8	44·7	29·143	...	D =45
13	April 22	1 25 14	17	15·5	0·92	45·0	44·9	44·9	29·146	45·39	A =45
		4 2 38	58	48·0	0·34	46·0	45·9	45·9	29·136	...	D =45
14	April 23	7 41 36	41	38·5	0·93	44·6	44·6	44·6	29·045	45·34	A =45
		10 18 31	41	36·0	0·36	45·0	45·0	45·0	29·224	...	D =45
15	April 23	10 27 31	33	32·0	0·90	45·2	45·1	45·1	29·244	45·34	A =45
		13 22 58	67	62·5	0·31	44·3	44·0	44·0	29·386	...	D =45
16	April 23	1 31 44	47	45·5	0·91	45·0	45·0	45·0	29·386	45·34	A =45
		4 17 56	73	64·5	0·32	43·5	43·5	43·5	29·480	...	D =45
17	April 24	7 32 22	26	24·0	0·94	41·8	41·8	41·8	29·623	45·10	A =42
		10 19 2	9	5·5	0·37	41·3	41·3	41·3	29·592	...	D =42
18	April 24	10 27 46	49	47·5	0·90	41·6	41·6	41·6	29·592	45·10	A =
		13 5 10	17	13·5	0·35	43·4	43·4	43·4	29·543	...	D =
19	April 24	1 13 44	45	44·5	0·93	43·9	43·9	43·8	29·544	45·10	A =
		4 0 8	19	13·5	0·34	43·2	43·0	43·0	29·493	...	D =
20	April 25	7 56 32	35	33·5	0·92	41·6	41·6	41·6	29·212	44·84	A =42
		10 34 6	11	8·5	0·37	41·0	41·0	41·0	29·159	...	D =42
21	April 25	10 43 18	20	19·0	0·88	42·4	42·4	42·4	29·158	44·84	A =42
		13 20 50	57	53·5	0·34	41·5	41·5	41·5	29·050	...	D =40
22	April 25	1 29 43	45	44·0	0·91	42·1	42·1	42·2	29·050	44·84	A =41
		4 16 22	40	31·0	0·33	41·5	41·4	41·4	29·000	...	D =40
23	April 26	8 34 45	49	47·0	0·89	41·4	41·4	41·4	29·292	44·51	A =42
		11 21 44	52	48·0	0.32	41·7	41·7	41·7	29·354	...	D =42
24	April 26	11 27 34	36	35·0	0·93	41·8	41·8	41·8	29·356	44·51	A =43
		14 14 25	34	29·5	0·34	43·2	43·2	43·4	29·380	...	D =42
25	April 27	7 54 38	42	40·0	0·93	43·2	43·2	43·2	29·197	45·22	A =43
		10 31 58	66	62·0	0·36	43·7	43·7	43·7	29·204	...	D =42
26	April 27	10 41 0	1	0·5	0·94	43·9	43·9	43·8	29·204	45·22	A =45
		13 27 20	29	24·5	0·33	44·7	44·5	44·5	29·178	...	D =43
27	April 27	1 33 56	59	57·5	0·90	45·0	44·8	44·8	29·178	45·22	A =44
		4 11 17	31	24·0	0·34	44·2	44·0	44·0	29·161	...	D =43

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Appendix. Table V.—Cape of Good Hope.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
				Pendulum No. 10.							
		h m s	s	s	s	°	°	°		s	°
1	Aug. 28	6 1 53	54	53·5	0·96	57·3	57·3	57·4	30·193	60·07	A =59
		9 29 30	38	34·0	0·28	58·0	58·0	58·0	30·194	...	D =53
2	Aug. 28	9 33 47	48	47·0	0·93	58·2	58·2	58·2	30·194	60·07	A =59
		13 15 33	39	36·0	0·26	58·8	58·9	59·0	30·160	...	D =53
3	Aug. 28	1 37 25	26	25·5	0·84	59·5	59·5	59·5	30·158	60·07	A =61
		4 14 40	47	43·5	0·33	59·2	59·2	59·2	30·150	...	D =55
4	Aug. 29	5 59 17	18	17·5	0·87	58·4	58·4	58·4	30·000	60·57	A =60
		8 36 33	39	36·0	0·34	59·0	59·0	59·0	29·993	...	D =54
5	Aug. 29	8 47 53	54	53·5	0·86	59·4	59·4	59·4	29·994	60·57	A =60
		11 25 3	9	6·0	0·34	59·8	59·8	59·8	30·064	...	D =54
6	Aug. 29	11 50 19	20	19·5	0·87	60·0	60·0	60·0	30·062	60·57	A =61
		14 34 34	47	40·5	0·32	59·6	59·6	59·6	30·102	...	D =56
7	Aug. 30	6 14 59	60	59·5	0·91	58·5	58·4	58·4	30·122	61·06	A =59
		8 52 16	22	19·0	0·35	58·3	58·3	58·3	30·142	...	D =54
8	Aug. 30	9 1 45	46	45·5	0·88	58·5	58·5	58·5	30·142	61·06	A =59
		11 38 59	65	62·0	0·34	59·1	59·1	59·1	30·118	...	D =54
9	Aug. 30	1 3 33	34	33·5	0·91	59·3	59·3	59·3	30·106	61·06	A =60
		3 40 42	50	46·0	0·35	59·2	59·2	59·2	30·100	...	D =57
10	Aug. 31	6 21 9	10	9·5	0·88	58·4	58·4	58·4	30·086	61·35	A =59
		9 13 34	39	36·5	0·32	58·5	58·5	58·5	30·090	...	D =49
11	Aug. 31	9 34 27	28	27·5	0·91	58·9	58·9	58·9	30·090	61·35	A =59
		12 12 23	30	26·5	0·36	58·4	58·4	58·4	30·060	...	D =53
12	Aug. 31	0 19 31	32	31·5	0·91	58·6	58·6	58·6	30·060	61·35	A =59
		3 54 51	61	56·0	0·26	58·0	58·0	58·0	30·091	...	D =53
13	Sept. 1	6 38 27	29	28·0	0·81	55·6	55·6	55·6	30·385	61·23	A =56
		9 16 56	61	58·5	0·32	56·7	56·7	56·7	30·433	...	D =49
14	Sept. 1	9 42 17	18	17·5	0·89	56·7	56·7	56·8	30·434	61·23	A =57
		12 49 19	25	22·0	0·29	57·4	57·4	57·5	30·423	...	D =52
15	Sept. 1	1 5 45	46	45·5	0·84	57·8	57·8	57·8	30·423	61·23	A =59
		3 51 4	11	7·5	0·32	57·5	57·5	57·5	30·450	...	D =50
16	Sept. 2	5 51 5	7	6·0	0·85	55·6	55·6	55·6	30·505	61·16	A =56
		9 19 46	54	50·0	0·26	56·7	56·7	56·7	30·502	...	D =50

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Appendix. Table V.—Cape of Good Hope.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	s	°	°	°		s	°
17	Sept. 2	9 24 25	26	25·5	0·88	56·7	56·7	56·7	30·502	61·16	A =57
		11 48 11	16	13·5	0·38	57·0	57·0	57·0	30·450	...	D =50
18	Sept. 2	11 59 1	2	1·5	0·92	57·0	57·0	57·0	30·450	61·16	A =57
		14 51 25	31	28·0	0·33	57·2	57·2	57·2	30·443	...	D =54
19	Sept. 4	5 27 3	4	3·5	0·88	56·0	56·0	56·0	30·132	61·08	A =57
		8 4 49	55	52·0	0·35	56·6	56·6	56·6	30·122	...	D =52
20	Sept. 4	8 7 57	58	57·5	0·90	56·6	56·6	56·6	30·122	61·08	A =57
		10 59 56	64	60·0	0·32	57·4	57·4	57·4	30·062	...	D =52
21	Sept. 4	11 3 9	10	9·5	0·84	57·6	57·6	57·6	30·062	61·08	A =59
		13 47 53	59	56·0	0·32	57·8	57·8	57·9	29·992	...	D =54
22	Sept. 4	1 51 14	16	15·0	0·87	57·9	57·9	57·9	29·992	61·08	A =59
		4 0 6	12	9·0	0·40	58·2	58·2	58·2	29·952	...	D =56
23	Sept. 4	4 5 35	39	37·0	0·85	58·2	58·2	58·2	29·952	61·08	A =59
		7 11 32	51	41·5	0·29	59·0	59·0	59·2	29·912	...	D =57
24	Sept. 4	7 15 11	16	13·5	0·86	59·0	59·0	59·2	29·902	61·08	A =59
		9 59 33	49	41·0	0·32	59·5	59·5	59·6	....	...	D =58
25	Sept. 4	10 3 39	44	41·5	0·87	59·6	59·6	59·8	29·908	61·08	A =60
		12 47 59	73	66·0	0·32	59·0	59·0	59·0	29·882	...	D =58
				Pendulum No. 11.							
1	Aug. 8	6 22 3	6	4·5	0·89	57·3	57·3	57·3	30·265	60·24	A =58
		9 25 2	14	8·0	0·30	57·6	57·6	57·6	30·272	...	D =55
2	Aug. 8	9 37 59	61	60·0	0·98	58·0	57·9	58·0	30·272	60·24	A =59
		12 40 44	54	49·0	0·31	58·4	58·5	58·5	30·245	...	D =55
3	Aug. 8	0 59 0	3	1·5	0·89	58·6	58·7	58·7	30·232	60·24	A =60
		4 1 45	58	51·5	0·28	58·4	58·5	58·5	30·229	...	D =57
4	Aug. 9	6 24 26	29	27·5	0·90	57·7	57·7	57·7	30·225	59·96	A =59
		9 27 13	25	19·0	0·30	58·2	58·4	58·4	30·211	...	D =55
5	Aug. 9	9 33 48	50	49·0	0·93	58·3	58·4	58·4	30·211	59·96	A =59
		12 36 29	42	35·5	0·30	58·5	58·6	58·6	30·085	...	D =57
6	Aug. 9	0 41 41	43	42·0	0·96	58·8	58·8	58·8	30·085	59·96	A =60
		4 3 33	46	39·5	0·27	59·0	59·0	59·0	30·017	...	D =58
7	Aug. 10	6 10 26	29	27·5	0·96	58·3	58·3	58·3	30·000	60·00	A =59
		9 22 42	54	48·0	0·29	58·4	58·4	58·4	30·050	...	D =55

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Appendix. Table V.—Cape of Good Hope.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
8	Aug. 10	9 38 13	16	14·5	0·89	58·4	58·4	58·4	30·050	60·00	A =59
		12 40 53	65	59·0	0·29	58·7	59·0	59·0	30·040	...	D =54
9	Aug. 10	0 46 11	12	11·5	0·98	59·0	59·0	59·0	30·040	60·00	A =60
		3 58 23	37	30·0	0·30	58·6	58·6	58·6	30·126	...	D =55
10	Aug. 11	6 8 10	12	11·0	0·97	56·5	56·5	56·5	30·043	60·04	A =57
		9 49 41	54	47·5	0·26	57·4	57·4	57·4	30·043	...	D =53
11	Aug. 11	9 58 46	48	47·0	0·97	57·5	57·6	57·6	30·043	60·04	A =59
		13 20 57	69	63·0	0·27	58·2	58·3	58·3	30·006	...	D =54
12	Aug. 11	1 26 55	57	56·0	0·94	58·5	58·5	58·5	30·006	60·04	A =59
		4 39 15	40	27·5	0·28	58·2	58·2	58·2	30·010	...	D =55
13	Aug. 12	6 10 1	3	2·0	0·95	57·3	57·3	57·3	30·083	60·14	A =57
		9 22 37	48	42·5	0·29	57·6	57·7	57·7	30·119	...	D =53
14	Aug. 12	1 21 44	48	46·0	0·97	58·4	58·3	58·4	30·092	60·14	A =60
		3 36 22	36	29·0	0·42	58·2	58·1	58·2	30·092	...	D =52
15	Aug. 13	6 36 12	14	13·0	0·95	57·2	57·2	57·2	30·411	60·14	A =57
		9 48 52	64	58·0	0·30	57·6	57·6	57·6	30·464	...	D =53
16	Aug. 13	9 55 2	3	2·5	0·96	57·6	57·6	57·7	30·464	60·14	A =59
		13 7 34	45	39·5	0·30	58·2	58·4	58·5	30·442	...	D =53
17	Aug. 13	1 15 13	15	14·0	0·92	58·4	58·4	58·6	30·442	60·14	A =60
		3 49 6	17	11·5	0·36	58·4	58·4	58·4	30·433	...	D =55
				Iron Pendulum		(Knife	edge	A.)		+	
1	Oct. 26	1 45 55	60	57·5	1·25	62·5	..	62·0	30·267	72·19	A =62
		4 20 16	38	27·0	0·36	62·8	..	62·5	30·260	...	D =56
2	Oct. 26	5 8 12	16	14·0	1·32	62·8	..	62·6	30·260	72·19	A =64
		7 51 3	24	13·5	0·36	63·2	..	62·8	30·250	...	D =57
3	Oct. 26	8 3 50	53	51·5	1·48	63·5	..	63·0	30·250	72·19	A =64
		11 46 39	73	56·0	0·28	63·8	..	63·5	30·212	...	D =55
4	Oct. 26	0 1 51	56	53·5	1·14	64·0	..	63·8	30·212	72·19	A =64
		2 1 46	76	61·0	0·45	63·8	..	63·5	30·213	...	D =57
5	Oct. 27	0 57 3	7	5·0	1·36	62·6	..	62·1	30·192	72·17	A =63
		3 48 29	52	40·5	0·36	63·0	..	62·5	30·200	...	D =55
6	Oct. 27	3 52 33	37	35·0	1·29	63·0	..	62·6	30·200	72·17	A =63
		5 52 27	44	35·5	0·49	63·3	..	63·0	30·200	...	D =56

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APPENDIX. TABLE V.—Cape of Good Hope.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
7	Oct. 27	5 58 32	37	34·5	1·32	63·2	..	63·0	30·200	72·17	A =63
		7 58 25	42	33·5	0·50	63·8	..	63·6	30·176	...	D =56
8	Oct. 27	8 3 32	35	33·5	1·48	63·8	..	63·6	30·176	72·17	A =64
		10 3 18	33	25·5	0·54	64·2	..	64·2	30·156	...	D =55
9	Oct. 27	10 8 23	28	25·5	1·24	64·2	..	64·2	30·156	72·17	A =65
		12 51 17	41	29·0	0·35	64·8	..	64·6	30·149	...	D =57
10	Oct. 27	0 55 36	41	38·5	1·13	64·8	..	64·7	30·149	72·17	A =65
		2 4 2	23	12·5	0·63	64·9	..	64·5	30·150	...	D =56
11	Oct. 28	0 52 30	34	32·0	1·24	63·6	..	63·1	30·164	71·81	A =64
		2 52 30	48	39·0	0·47	63·7	..	63·0	30·156	...	D =55
12	Oct. 28	3 6 33	40	36·5	1·03	63·7	..	63·1	30·156	71·81	A =64
		*5 6 40	57	48·5	0·43	63·9	..	63·6	30·158	...	D =56
13	Oct. 28	5 12 39	46	42·5	1·13	63·9	..	63·6	30·158	71·81	A =64
		7 21 15	36	25·5	0·44	64·3	..	64·2	30·142	...	D =56
14	Oct. 28	7 28 50	55	52·5	1·27	64·5	..	64·2	30·142	71·81	A =64
		9 28 47	63	55·0	0·49	64·8	..	64·6	30·119	...	D =57
15	Oct. 28	9 36 4	9	6·5	1·16	64·9	..	64·6	30·119	71·81	A =64
		11 53 15	36	25·5	0·42	65·1	..	65·0	30·092	...	D =57
16	Oct. 28	11 55 55	61	58·0	1·22	65·2	..	65·1	30·092	71·81	A =64
		†13 55 53	77	65·0	0·47	65·0	..	64·8	30·088	...	D =58
				Position changed.							
17	Nov. 14	7 11 49	55	52·0	1·24	64·7	..	64·5	30·119	65·95	A =64
		9 31 7	28	17·5	0·40	64·9	..	64·8	30·123	...	D =60
18	Nov. 14	9 34 53	58	55·5	1·12	64·9	..	64·9	30·123	65·95	A =65
		11 54 24	44	34·0	0·38	65·8	..	65·6	30·109	...	D =57
19	Nov. 14	12 0 43	49	46·0	1·19	65·8	..	65·6	30·109	65·95	A =66
		2 11 19	38	28·5	0·41	66·1	..	66·0	30·063	...	D =58
20	Nov. 14	2 15 4	8	6·0	1·26	66·1	..	66·0	30·063	65·95	A =66
		4 8 5	22	13·5	0·49	66·6	..	66·5	30·025	...	D =60
21	Nov. 14	4 12 7	12	9·5	1·21	66·6	..	66·5	30·025	65·95	A =67
		6 40 3	22	12·5	0·37	67·0	..	66·8	30·007	...	D =62

* In the original manuscript this is $5^h\ 7^m\ 40^s$: but, on comparing the time with that of the preceding coincidences, it is evident that the minute should be 6.—B.

† In the original manuscript this value is $13^h\ 56^m\ 53^s$: but, on comparing the time of the coincidence with that of the preceding ones, it is evident that an error of one minute has been committed.—B.

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Appendix. Table V.—Cape of Good Hope.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
22	Nov. 15	7 11 25	30	27·5	1·32	65·2	..	65·0	30·050	65·85	A =65
		9 30 37	56	46·5	0·42	65·5	..	65·4	30·100	...	D =59
23	Nov. 15	9 35 44	50	47·0	1·32	65·5	..	65·4	30·100	65·85	A =67
		11 55 5	24	14·5	0·42	66·0	..	65·8	30·100	...	D =59
24	Nov. 15	11 58 49	54	51·5	1·25	66·0	..	65·9	30·100	65·85	A =67
		14 18 2	20	11·0	0·40	66·5	..	66·4	30·119	...	D =60
25	Nov. 15	2 22 23	27	25·0	1·25	66·6	..	66·5	30·119	65·85	A =67
		4 50 19	38	28·5	0·38	66·9	..	66·8	30·123	...	D =60
26	Nov. 15	4 54 16	22	19·0	1·12	66·9	..	66·8	30·123	65·85	A =67
		7 13 29	53	41·0	0·36	67·0	..	66·7	30·130	...	D =60
27	Nov. 18	1 43 31	36	33·5	1·25	65·0	..	65·0	30·180	65·84	A =65
		4 11 32	52	42·0	0·38	65·2	..	65·2	30·211	...	D =57
28	Nov. 18	5 44 4	10	7·0	1·18	65·4	..	65·2	30·213	65·84	A =65
		7 54 42	64	53·0	0·42	65·0	..	64·7	30·251	...	D =55
				(Knife edge B.)							
1	Oct. 29	1 4 32	37	34·5	1·23	64·0	..	63·6	29·951	72·62	A =64
		3 13 10	27	18·5	0·46	64·1	..	63·8	29·977	...	D =57
2	Oct. 29	3 20 20	23	21·5	1·27	64·2	..	63·8	29·977	72·62	A =64
		5 28 56	73	64·5	0·46	64·6	..	64·2	29·979	...	D =57
3	Oct. 29	5 36 19	24	21·5	1·13	64·6	..	64·4	29·984	72·62	A =64
		7 45 1	17	9·0	0·45	65·0	..	64·9	29·966	...	D =58
4	Oct. 29	7 51 56	59	57·5	1·14	65·0	..	65·0	29·966	72·62	A =65
		10 0 43	58	50·5	0·44	65·7	..	65·6	29·976	...	D =57
5	Oct. 29	10 6 58	61	59·5	1·24	65·6	..	65·8	29·976	72·62	A =65
		12 32 50	71	60·5	0·42	65·8	..	65·4	30·040	...	D =62
6	Oct. 29	0 37 56	61	58·5	1·25	65·8	..	65·5	30·040	72·62	A =64
		1 55 2	20	11·0	0·66	65·6	..	65·2	30·050	...	D =63
7	Oct. 30	1 1 42	47	44·5	1·10	64·5	..	63·9	30·081	71·87	A =64
		3 19 9	27	18·0	0·41	64·0	..	63·7	30·128	...	D =57
8	Oct. 30	3 25 9	13	11·0	1·15	64·2	..	64·0	30·128	71·87	A =65
		5 51 7	24	15·5	0·40	64·5	..	64·5	30·126	...	D =57
9	Oct. 30	5 56 47	51	49·0	1·26	64·5	..	64·5	30·126	71·87	A =64
		8 22 37	55	46·0	0·43	64·9	..	64·9	30·111	...	D =57

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APPENDIX. TABLE V.—Cape of Good Hope.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
10	Oct. 30	8 30 54	56	55·0	1·17	64·9	..	64·9	30·111	71·87	A =65
		11 31 11	32	21·5	0·31	65·1	..	65·1	30·100	...	D =56
11	Oct. 30	11 36 22	25	23·5	1·15	65·2	..	65·2	30·100	71·87	A =65
		13 53 39	62	50·5	0·42	65·0	..	64·7	30·101	...	D =57
12	Oct. 31	0 55 42	47	44·5	1·18	64·1	..	63·6	30·135	72·10	A =63
		3 13 6	23	14·5	0·43	64·0	..	63·7	30·162	...	D =53
13	Oct. 31	3 20 46	50	48·0	1·13	64·1	..	63·8	30·162	72·10	A =64
		5 38 8	25	16·5	0·43	64·6	..	64·5	30·162	...	D =55
14	Oct. 31	5 42 35	39	37·0	1·21	64·6	..	64·5	30·162	72·10	A =64
		7 51 20	35	27·5	0·46	64·7	..	64·7	30·164	...	D =57
15	Oct. 31	7 56 51	53	52·0	1·25	65·0	..	65·0	30·164	72·10	A =65
		10 5 32	48	40·0	0·47	64·8	..	64·6	30·146	...	D =57
16	Oct. 31	10 20 37	43	40·0	1·17	65·0	..	65·1	30·146	72·10	A =65
		12 46 35	56	45·5	0·39	65·2	..	64·9	30·145	...	D =58
				Position changed.							
17	Nov. 16	7 20 37	42	39·5	1·16	64·9	..	64·8	30·221	66·07	A =64
		9 40 9	26	17·5	0·41	64·8	..	64·6	30·228	...	D =57
18	Nov. 16	9 44 31	34	32·5	1·32	65·0	..	64·9	30·228	66·07	A =66
		12 21 34	54	44·0	0·40	65·2	..	65·2	30·249	...	D =59
19	Nov. 16	0 25 23	28	25·5	1·23	65·2	..	65·0	30·249	66·07	A =66
		2 53 39	56	47·5	0·40	65·6	..	65·4	30·241	...	D =59
20	Nov. 16	2 57 19	24	21·5	1·28	65·6	..	65·4	30·241	66·07	A =66
		5 25 31	52	41·5	0·40	65·7	..	65·5	30·219	...	D =56
21	Nov. 16	5 29 59	66	62·5	1·22	65·6	..	65·6	30·219	66·07	A =66
		7 58 14	39	26·5	0·39	65·5	..	65·2	30·229	...	D =54
22	Nov. 17	7 6 0	6	3·0	1·16	64·1	..	63·9	30·124	65·92	A =64
		9 25 38	56	47·0	0·40	64·1	..	64·0	30·127	...	D =54
23	Nov. 17	9 29 17	22	19·5	1·18	64·1	..	64·0	30·127,	65·92	A =64
		11 57 47	66	56·5	0·40	64·7	..	64·5	30·111	...	D =53
24	Nov. 17	0 1 53	58	55·5	1·30	64·7	..	64·6	30·111	65·92	A =64
		2 38 53	73	63·0	0·40	65·1	..	65·0	30·077	...	D =55
25	Nov. 17	2 42 47	54	50·5	1·26	65·1	..	65·0	30·077	65·92	A =
		4 44 50	68	59·0	0·47	65·2	..	65·1	30·055	...	D =
26	Nov. 17	4 48 11	14	12·5	1·29	65·2	..	65·1	30·055	65·92	A =64
		7 7 42	59	50·5	0·44	65·4	..	65·0	30·057	...	D =55

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Appendix. Table V.—Cape of Good Hope.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	s	°	°	°		s	°
27	Nov. 18	7 46 7	12	9·5	1·18	64·2	..	64·0	30·113	65·84	A =64
		10 32 5	26	15·5	0·34	64·3	..	64·2	30·153	...	D =55
28	Nov. 18	10 44 55	60	57·5	1·23	64·3	..	64·2	30·163	65·84	A =65
		13 13 21	38	29·5	0·39	64·8	..	64·7	30·181	...	D =57
			Copper Pendulum (Knife edge A).							+	
1	Nov. 3	0 50 28	31	29·5	1·28	61·0	..	60·8	30·230	72·10	A =61
		3 19 37	56	46·5	0·44	61·2	..	61·1	30·229	...	D =51
2	Nov. 3	3 24 30	35	32·5	1·17	61·2	..	61·1	30·229	72·10	A =62
		5 44 51	70	60·5	0·44	61·9	..	61·8	30·250	...	D =52
3	Nov. 3	5 49 22	27	24·5	1·27	61·9	..	61·8	30·250	72·10	A =62
		8 18 23	42	32·5	0·43	62·8	..	62·6	30·225	...	D =54
4	Nov. 3	8 25 53	59	56·0	1·19	62·8	..	62·7	30·225	72·10	A =63
		10 54 55	76	65·5	0·42	63·2	..	63·1	30·201	...	D =55
5	Nov. 3	10 59 0	5	2·5	1·16	63·3	..	63·3	30·201	72·10	A =63
		13 28 5	27	16·0	0·42	63·6	..	63·4	30·189	...	D =57
6	Nov. 4	0 54 32	35	33·5	1·22	62·0	..	61·7	30·126	71·68	A =62
		3 23 39	57	48·0	0·42	62·5	..	62·4	30·157	...	D =52
7	Nov. 4	3 28 20	25	22·5	1·15	62·5	..	62·4	30·157	71·68	A =64
		5 57 25	45	35·0	0·40	63·0	..	62·9	30·150	...	D =53
8	Nov. 4	6 1 38	43	40·5	1·09	63·0	..	63·0	30·150	71·68	A =64
		8 21 54	73	63·5	0·41	63·8	..	63·6	30·116	...	D =54
9	Nov. 4	8 26 39	45	42·0	1·19	63·8	..	63·6	30·116	71·68	A =64
		10 46 50	69	59·5	0·44	64·1	..	64·0	30·100	...	D =56
10	Nov. 4	10 49 54	60	57·0	1·14	64·1	..	64·0	30·100	71·68	A =64
		13 18 54	74	64·0	0·40	64·6	..	64·3	30·093	...	D =57
11	Nov. 5	0 55 0	5	2·5	1·24	63·5	..	63·0	30·079	71·44	A =64
		3 24 7	26	16·5	0·42	63·5	..	63·1	30·100	...	D =56
12	Nov. 5	3 28 48	54	51·0	1·20	63·6	..	63·2	30·100	71·44	A =64
		5 57 57	76	66·5	0·42	64·0	..	63·8	30·075	...	D =57
13	Nov. 5	6 6 6	11	8·5	1·08	64·1	..	64·0	30·075	71·44	A =64
		8 35 15	36	25·5	0·39	64·6	..	64·5	30·053	...	D =57
14	Nov. 5	8 42 28	31	29·5	1·23	64·7	..	64·6	30·053	71·44	A =65
		11 20 19	40	29·5	0·41	65·0	..	65·0	30·023	...	D =57

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APPENDIX. TABLE V.—Cape of Good Hope.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
15	Nov. 5	11 24 56	60	58·0	1·24	65·2	..	65·2	30·023	71·44	A =65
		13 45 11	32	21·5	0·47	65·4	..	65·1	30·011	...	D =59
				Position changed.							
16	Nov. 19	7 39 46	52	49·0	1·22	63·7	..	63·6	30·311	65·85	A =64
		10 11 5	22	13·5	0·39	64·0	..	63·7	30·313	...	D =52
17	Nov. 19	10 15 20	23	21·5	1·28	64·0	..	63·7	30·313	65·85	A =64
		12 46 40	60	50·0	0·41	64·5	..	64·2	30·291	...	D =53
18	Nov. 19	1 24 50	57	53·5	1·14	64·8	..	64·5	30·275	65·85	A =65
		3 56 9	26	17·5	0·37	65·0	..	64·9	30·223	...	D =53
19	Nov. 19	4 14 54	58	56·0	1·28	65·1	..	65·1	30·223	65·85	A =65
		6 55 1	20	10·5	0·38	65·0	..	64·9	30·201	...	D =55
20	Nov. 20	7 48 2	7	4·5	1·22	64·4	..	64·0	30·165	65·53	A =64
		10 10 25	38	31·5	0·42	64·6	..	64·5	30·165	...	D =55
21	Nov. 20	10 58 58	63	60·5	1·08	64·8	..	64·6	30·165	65·53	A =62
		13 39 14	34	24·0	0·34	65·2	..	65·1	30·150	...	D =57
22	Nov. 20	1 47 44	48	46·0	1·25	65·4	..	65·3	30·151	65·53	A =65
		4 18 49	68	58·5	0·41	65·9	..	65·6	30·125	...	D =57
23	Nov. 20	4 22 26	29	27·5	1·22	65·9	..	65·6	30·125	65·53	A =66
		7 2 27	44	35·5	0·37	66·1	..	66·0	30·113	...	D =57
				(Knife edge B.)							
1	Nov. 6	1 5 32	36	34·0	1·24	64·8	..	64·7	29·911	71·34	A =65
		3 33 57	73	65·0	0·47	65·0	..	64·9	29·950	...	D =58
2	Nov. 6	3 38 19	22	20·5	1·35	65·0	..	64·9	29·946	71·34	A =64
		6 32 53	71	62·0	0·43	65·5	..	65·3	29·945	...	D =58
3	Nov. 6	6 41 12	15	13·5	1·24	65·5	..	65·3	29·945	71·34	A =66
		9 27 5	22	13·5	0·42	66·0	..	65·8	29·931	...	D =60
4	Nov. 6	9 31 32	35	33·5	1·19	66·0	..	65·9	29·931	71·34	A =66
		12 8 39	54	46·5	0·42	66·1	..	66·0	29·936	...	D =62
5	Nov. 6	0 14 10	17	13·5	1·10	66·1	..	66·0	29·936	71·34	A =66
		1 58 46	69	57·5	0·53	66·2	..	66·1	29·959	...	D =62
6	Nov. 7	0 40 39	46	42·5	1·15	65·0	..	64·8	30·015	71·26	A =64
		3 9 7	24	15·5	0·44	65·0	..	65·0	30·020	...	D =58
7	Nov. 7	3 13 7	12	9·5	1·20	65·0	..	65·0	30·020	71·26	A =65
		5 41 29	46	37·5	0·45	65·2	..	65·1	30·045	...	D =62

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Appendix. Table V.—Cape of Good Hope.

No.	1829.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
8	Nov. 7	5 46 31	36	33·5	1·28	65·3	..	65·1	30·045	71·26	A =65
		9 23 31	50	40·5	0·45	65·7	..	65·6	30·035	...	D =59
9	Nov. 7	8 29 26	30	28·0	1·28	65·8	..	65·6	30·035	71·26	A =65
		10 57 40	57	48·5	0·47	65·9	..	65·8	30·015	...	D =60
10	Nov. 7	11 1 12	17	14·5	1·13	66·0	..	65·7	30·015	71·26	A =65
		13 29 33	50	41·5	0·44	66·1	..	66·0	30·020	...	D =60
11	Nov. 8	0 32 34	41	37·5	1·25	65·0	..	64·8	30·156	71·26	A =64
		3 1 1	17	9·0	0·46	65·0	..	65·0	30·155	...	D =60
12	Nov. 8	3 5 52	57	54·5	1·23	65·1	..	65·0	30·155	71·26	A =65
		5 34 15	30	22·5	0·46	65·7	..	65·6	30·161	...	D =59
13	Nov. 8	5 38 14	18	16·0	1·30	65·7	..	65·6	30·161	71·26	A =65
		8 15 15	30	22·5	0·45	66·1	..	66·1	30·139	...	D =60
14	Nov. 8	8 19 54	57	55·5	1·25	66·1	..	66·1	30·130	71·26	A =66
		10 56 55	71	63·0	0·44	66·7	..	66·5	30·101	...	D =61
15	Nov. 8	11 1 34	38	36·0	1·26	66·8	..	66·5	30·101	71·26	A =67
		13 29 47	64	55·5	0·46	67·0	..	66·8	30·100	...	D =61
				Position changed.							
16	Nov. 21	7 49·59	64	61·5	1·10	64·8	..	64·7	30·121	65·46	A =65
		10 20 45	60	52·5	0·39	65·0	..	65·0	30·123	...	D =56
17	Nov. 21	10 43 48	53	50·5	1·24	65·2	..	65·1	30·123	65·46	A =65
		13 23 19	35	27·0	0·40	66·0	..	65·8	30·113	...	D =57
18	Nov. 21	1 27 41	44	42·5	1·27	66·1	..	66·0	30·111	65·46	A =67
		3 58 7	22	14·5	0·44	66·9	..	66·7	30·071	...	D =57
19	Nov. 21	4 1 55	58	56·5	1·27	66·9	..	66·8	30·071	65·46	A =67
		6 49 59	78	68·5	0·40	67·6	..	67·1	30·051	...	D =59
20	Nov. 22	7 40 18	23	20·5	1·21	66·9	..	66·5	30·020	65·46	A =67
		10 10 51	66	58·5	0·42	67·1	..	66·8	30·023	...	D =57
21	Nov. 22	10 15 46	49	47·5	1·27	67·1	..	66·8	30·023	65·46	A =68
		12 55 9	28	18·5	0·42	68·2	..	68·0	30·009	...	D =62
22	Nov. 22	1 22 7	12	9·5	1·26	68·5	..	68·2	30·009	65·46	A =69
		4 1 19	34	26·5	0·42	69·5	..	69·0	29·997	...	D =62
23	Nov. 22	4 14 8	13	10·5	1·22	69·5	..	69·1	29·997	65·46	A =70
		7 10 55	74	64·5	0·36	70·0	..	69·8	29·983	...	D =63

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APPENDIX. TABLE V.—St. Helena.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
				Pendulum		No. 10.					
		h m s	s	s	°	°	°	°		s	°
1	Jan. 7	6 1 51	53	52·0	0·93	76·0	76·0	76·1	30·126	106·70	A =76
		8 51 32	38	35·0	0·35	75·9	75·6	75·9	30·145	...	D =68
2	Jan. 7	9 0 9	11	10·0	0·91	76·1	75·9	76·0	30·145	106·70	A =76
		12 10 58	67	62·5	0·29	76·4	76·4	76·4	30·148	...	D =68
3	Jan. 7	0 17 3	5	4·0	0·88	76·6	76·6	76·7	30·148	106·70	A =76
		2 59 28	35	31·5	0·33	76·4	76·4	76·4	30·111	...	D =66
4	Jan. 7	3 6 38	41	39·5	0·92	76·8	76·8	76·8	30·111	106·70	A =77
		5 48 58	68	63·0	0·34	76·5	76·5	76·4	30·113	...	D =66
5	Jan. 8	5 49 43	46	44·5	0·92	75·9	75·7	75·9	30·141	106·01	A =77
		8 25 20	27	23·5	0·37	76·0	75·9	76·0	30·145	...	D =70
6	Jan. 8	8 28 56	58	57·0	0·89	76·0	75·9	76·0	30·145	106·01	A =
		11 4 28	34	31·0	0·35	76·2	76·1	76·3	30·152	...	D =
7	Jan. 8	11 8 28	29	28·5	0·94	76·2	76·1	76·3	30·152	106·01	A =77
		13 43 56	63	59·5	0·37	76·5	76·4	76·6	30·119	...	D =69
8	Jan. 8	1 50 28	31	29·5	0·91	76·5	76·4	76·8	30·119	106·01	A =77
		4 25 57	64	60·5	0·36	76·6	76·6	76·5	30·112	...	D =69
9	Jan. 8	4 29 43	45	44·0	0·90	76·6	76·5	76·5	30·112	106·01	A= 77
		6 15 36	44	40·0	0·49	76·7	76·6	76·6	30·112	...	D =69
10	Jan. 9	5 35 3	6	4·5	0·90	75·9	75·7	75·8	30·133	105·97	A =76
		8 31 46	53	49·5	0·31	75·6	75·5	75·6	30·144	...	D =67
11	Jan. 9	8 35 3	5	4·0	0·89	75·6	75·6	75·8	30·144	105·97	A =77
		11 24 42	49	44·5	0·32	76·1	76·0	76·1	30·141	...	D =70
12	Jan. 9	11 48 5	7	6·0	0·92	76·1	76·4	76·5	30·141	105·97	A =77
		14 44 44	52	48·0	0·31	76·4	75·9	76·2	30·113	...	D =70
13	Jan. 9	2 48 28	30	29·0	0·90	76·5	76·4	76·6	30·113	105·97	A =77
		5 45 6	15	10·5	0·31	76·4	76·2	76·4	30·112	...	D =70
14	Jan. 10	5 26 32	35	33·5	0·92	75·7	75·5	75·7	30·133	105·69	A =76
		8 23 10	17	13·5	0·32	75·5	75·4	75·5	30·155	...	D =69
15	Jan. 10	8 27 3	5	4·0	0·92	75·6	75·5	75·6	30·155	105·69	A =77
		11 23 38	45	41·5	0·32	76·0	75·8	76·0	30·150	...	D =69
16	Jan. 10	11 47 2	4	3·0	0·92	76·3	76·4	76·5	30·150	105·69	A =77
		14 43 33	39	36·0	0·33	76·4	76·0	76·3	30·125	...	D =70

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Appendix. *Table V.—St. Helena.*

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
17	Jan. 10	2 48 0	1	0·5	0·94	76·6	76·5	76·6	30·125	105·69	A =77
		5 51 32	41	36·5	0·30	76·4	76·3	76·4	30·115	...	D =70
18	Jan. 11	5 27 52	55	53·5	0·87	75·9	75·7	75·9	30·121	106·04	A =76
		8 24 34	42	38·0	0·30	75·7	75·5	75·7	30·131	...	D =68
19	Jan. 11	8 28 12	13	12·5	0·89	76·0	75·9	76·2	30·131	106·04	A =76
		11 31 54	61	57·5	0·29	75·7	75·6	75·7	30·128	...	D =70
20	Jan. 11	11 48 10	11	10·5	0·93	76·4	76·3	76·5	30·128	106·04	A =76
		14 44 45	51	48·0	0·32	76·1	76·0	76·2	30·113	...	D =69
21	Jan. 11	2 47 54	55	54·5	0·94	76·3	76·4	76·6	30·153	106·04	A =77
		5 51 30	39	34·5	0·31	76·5	76·2	76·4	30·108	...	D =67
				Pendulum	No. 11.						
1	Jan. 12	7 54 13	16	14·5	0·87	76·0	75·8	76·0	30·127	106·07	A =77
		10 54 0	12	6·0	0·29	76·4	76·3	76·4	30·125	...	D =69
2	Jan. 12	10 59 2	4	3·0	0·96	76·6	76·4	76·6	30·125	106·07	A =77
		13 58 47	60	53·5	0·31	76·3	76·0	76·3	30·125	...	D =69
3	Jan. 12	2 3 53	56	54·5	0·90	76·4	76·3	76·4	30·125	106·07	A =77
		5 3 36	48	42·0	0·30	76·6	76·5	76·6	30·123	...	D =69
4	Jan. 13	5 21 52	55	53·5	0·95	76·0	75·9	76·0	30·125	106·09	A =76
		8 31 7	18	12·5	0·30	76·4	76·3	76·4	30·125	...	D =70
5	Jan. 13	8 35 24	27	25·5	0·90	76·4	76·2	76·3	30·125	106·09	A =76
		11 44 33	45	39·0	0·28	76·5	76·4	76·6	30·125	...	D =70
6	Jan. 13	11 48 22	25	23·5	0·93	76·6	76·6	76·6	30·125	106·09	A =76
		14 47 59	70	64·5	0·31	76·4	76·4	76·4	30·077	...	D =68
7	Jan. 13	2 52 11	13	12·0	0·91	76·6	76·5	76·6	30·077	106·09	A =77
		6 1 7	29	18·0	0·27	76·7	76·6	76·7	30·077	...	D =68
8	Jan. 14	5 20 47	51	49·0	0·90	76·5	76·4	76·5	30·125	105·87	A =76
		8 20 39	50	44·5	0·29	76·5	76·5	76·5	30·126	...	D =68
9	Jan. 14	8 24 23	25	24·0	0·95	76·5	76·4	76·5	30·126	105·87	A =
		11 24 7	16	11·5	0·32	76·7	76·7	76·8	30·126	...	D =
10	Jan. 14	11 46 49	51	50·0	0·93	77·2	77·0	77·3	30·125	105·87	A =77
		14 46 29	42	35·5	0·31	76·8	76·7	76·9	30·117	...	D =68
11	Jan. 14	2 50 51	54	52·5	0·90	77·1	77·1	77·3	30·117	105·87	A =77
		5 50 27	41	34·0	0·30	76·8	76·3	76·8	30·113	...	D =70

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APPENDIX. TABLE V.—St. Helena.

No.	1830	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
12	Jan. 15	5 22 54	58	56·0	0·92	76·5	76·3	76·5	30·148	105·89	A =76
		8 22 37	48	42·5	0·31	76·6	76·4	76·6	30·175	...	D =68
13	Jan. 15	8 26 36	39	37·5	0·93	76·6	76·4	76·6	30·175	105·89	A =76
		11 16 41	52	46·5	0·33	76·7	76·6	76·7	30·171	...	D =69
14	Jan. 15	11 41 13	15	14·0	0·90	76·8	76·7	76·8	30·166	105·89	A =77
		14 40 45	56	50·5	0·30	77·2	77·0	77·3	30·123	...	D =69
15	Jan. 15	2 44 41	43	42·0	0·92	77·4	77·3	77·5	30·123	105·89	A =77
		5 44 5	22	13·5	0·31	77·0	76·8	77·0	30·121	...	D =68
16	Jan. 16	5 47 12	17	14·5	0·89	76·5	76·4	76·5	30·163	105·88	A =77
		8 27 57	66	61·5	0·32	76·8	76·6	76·8	30·170	...	D =68
17	Jan. 16	8 31 37	39	38·0	0·94	76·8	76·6	76·8	30·170	105·88	A =77
		11 40 33	44	38·5	0·30	77·0	77·0	77·2	30·161	...	D =69
18	Jan. 16	11 44 14	15	14·5	0·94	77·0	76·9	77·1	30·161	105·88	A =78
		14 43 47	57	52·0	0·32	77·4	77·3	77·5	30·123	...	D =69
19	Jan. 16	2 47 34	36	35·0	0·87	77·6	77·5	77·6	30·123	105·88	A =78
		5 47 7	21	14·0	0·29	77·3	77·1	77·3	30·120	...	D =69
20	Jan. 17	5 25 30	35	32·5	0·96	76·8	76·7	76·8	30·133	105·86	A =77
		*8 34 31	42	36·5	0·30	77·0	76·9	77·0	30·163	...	D =70
21	Jan. 17	8 38 19	21	20·0	0·92	77·1	77·0	77·0	30·163	105·86	A =77
		11 37 45	56	50·5	0·31	76·9	76·7	77·3	30·150	...	D =68
22	Jan. 17	11 41 0	1	0·5	0·93	77·1	77·0	77·2	30·140	105·86	A =77
		14 40 21	32	26·5	0·31	77·5	77·4	77·6	30·119	...	D =70
23	Jan. 17	2 44 26	27	26·5	0·94	77·7	77·7	77·8	30·125	105·86	A =77
		5 43 41	55	48·0	0·32	77·4	77·4	77·4	30·136	...	D =71
24	Jan. 18	6 45 12	13	12·5	0·92	76·9	76·9	76·9	30·151	105·86	A =77
		9 44 41	52	46·5	0·31	77·3	77·1	77·3	30·155	...	D =68
			Copper Pendulum (Knife edge A).							+	
1	Jan. 26	3 38 3	10	6·5	1·29	77·2	..	76·9	30·133	16·69	A =77
		6 1 12	32	22·0	0·45	77·4	..	76·8	....	...	D =68
2	Jan. 27	3 24 51	58	54·5	1·31	78·2	..	77·4	30·127	16·68	A =77
		6 23 50	76	63·0	0·32	78·0	..	77·5	30·119	...	D =68

* The time of the last disappearance is $8^h\ 36^m\ 31^s$ in the original manuscript: but this will not accord with the time of the coincidences immediately preceding; which evidently requires the time stated in the text, and which I have consequently adopted.—B.

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Appendix. Table V.—St. Helena.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
3	Jan. 27	6 27 51	58	54·5	1·13	78·0	..	77·4	30·119	16·68	A =78
		9 27 4	26	15·0	0·28	78·1	..	77·6	30·121	...	D =72
4	Jan. 27	9 48 16	19	17·5	1·31	78·5	..	77·5	30·108	16·68	A =78
		12 47 29	50	39·5	0·32	78·8	..	78·5	30·101	...	D =72
5	Jan. 27	0 51 40	48	44·0	1·10	78·8	..	78·5	30·100	16·68	A =78
		*3 59 35	75	55·0	0·26	79·0	..	78·2	30·101	...	D =72
6	Jan. 28	3 25 38	46	42·0	1·22	78·0	..	77·5	30·101	16·68	A =77
		5 57 52	72	62·0	0·37	78·0	..	77·6	30·103	...	D =70
7	Jan. 28	6 1 25	30	27·5	1·30	78·0	..	77·6	30·103	16·68	A =77
		10 3 16	46	31·0	0·23	78·5	..	78·0	30·090	...	D =70
8	Jan. 28	10 6 51	56	53·5	1·27	78·5	..	78·0	30·092	16·68	A =79
		12 57 5	26	15·5	0·33	78·8	..	78·5	30·096	...	D =70
9	Jan. 28	1 0 54	60	57·0	1·35	78·8	..	78·5	30·096	16·68	A =79
		4 17 26	81	53·5	0·26	78·8	..	78·0	30·096	...	D =70
				(Knife edge B.)							
1	Jan. 23	3 49 59	67	63·0	1·19	76·9	..	76·5	30·163	17·14	A =76
		6 48 7	26	16·5	0·34	76·8	..	76·4	30·165	...	D =68
2	Jan. 23	6 51 48	53	50·5	1·34	76·8	..	76·5	30·165	17·14	A =76
		9 49 47	67	57·0	0·35	77·1	..	76·9	30·163	...	D =68
3	Jan. 23	9 52 58	64	61·0	1·23	77·1	..	76·9	30·163	17·14	A =77
		12 51 19	40	29·5	0·34	77·5	..	77·1	30·151	...	D =68
4	Jan. 23	0 55 22	25	23·5	1·40	77·5	..	77·2	30·151	17·14	A =77
		3 53 14	38	26·0	0·36	77·6	..	77·0	30·150	...	D =68
5	Jan. 24	3 34 33	44	38·5	1·26	76·8	..	76·5	30·151	17·18	A =76
		6 32 44	66	55·0	0·33	76·7	..	76·1	30·171	...	D =65
6	Jan. 24	6 36 32	41	36·5	1·16	76·7	..	76·2	30·171	17·18	A =77
		9 43 35	58	46·5	0·31	77·0	..	76·5	30·161	...	D =69
7	Jan. 24	9 47 33	39	36·0	1·22	77·0	..	76·5	30·161	17·18	A =77
		12 45 53	72	62·5	0·34	77·2	..	76·9	30·138	...	D =69
8	Jan. 24	0 49 39	46	42·5	1·26	77·2	..	77·0	30·138	17·18	A =77
		3 56 31	58	44·5	0·32	77·5	..	76·8	30·125	...	D =68
9	Jan. 25	3 39 48	56	52·0	1·27	77·0	..	76·4	30·165	16·78	A =77
		6 37 53	74	63·5	0·36	77·0	..	76·5	30·173	...	D =67

* Indifferent observation: day-light too feeble.—F.

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APPENDIX. TABLE V.—St. Helena.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
10	Jan. 25	6 40 28	33	30·5	1·31	77·0	..	76·5	30·173	16·78	A =77
		9 47 25	43	34·0	0·33	77·1	..	76·9	30·163	...	D =67
11	Jan. 25	9 51 11	16	13·5	1·20	77·1	..	76·9	30·162	16·78	A =
		12 49 29	50	39·5	0·33	77·6	..	77·1	30·130	...	D =
12	Jan. 25	0 52 54	62	58·0	1·21	77·6	..	77·3	30·130	16·78	A =77
		3 59 47	76	61·5	0·31	77·9	..	77·1	30·129	...	D =68
		Ascension Island.									
		Pendulum No. 10.								−	
1	Mar. 5	8 44 59	60	59·5	0·95	81·4	81·4	81·5	30·158	121·87	A =82
		11 40 38	45	41·5	0·34	82·0	82·0	82·0	30·151	...	D =74
2	Mar. 5	11 44 24	26	25·0	0·96	82·4	82·3	82·4	30·151	121·87	A =82
		14 33 4	11	7·5	0·35	82·0	81·8	81·8	30·130	...	D =74
3	Mar. 5	2 36 21	22	21·5	0·94	82·1	82·0	82·1	30·130	121·87	A =82
		5 11 2	9	5·5	0·38	81·6	81·6	81·6	30·131	...	D =70
4	Mar. 6	5 23 20	22	21·0	0·95	80·1	80·0	80·1	30·139	121·78	A =80
		8 26 15	23	19·0	0·31	81·0	81·0	81·0	30·143	...	D =72
5	Mar. 6	8 29 9	11	10·0	0·95	81·0	81·0	81·0	30·143	121·78	A =81
		11 24 47	55	51·0	0·34	82·0	81·9	82·0	30·140	...	D =73
6	Mar. 6	11 27 55	57	56·0	0·90	82·0	81·9	82·0	30·140	121·78	A =83
		15 12 40	51	45·5	0·24	82·4	82·4	82·4	30·121	...	D =73
7	Mar. 6	3 16 3	5	4·0	0·91	82·8	82·6	82·8	30·121	121·78	A =83
		5 8 20	27	23·5	0·47	82·4	82·3	82·4	30·131	...	D =74
8	Mar. 7	5 5 19	20	19·5	0·95	80·5	80·4	80·5	30·121	121·54	A =81
		8 15 2	11	6·5	0·31	81·3	81·2	81·3	30·135	...	D =74
9	Mar. 7	8 18 22	25	23·5	0·92	81·3	81·2	81·3	30·135	121·54	A =81
		11 34 56	66	61·0	0·29	82·3	82·3	82·3	30·127	...	D =73
10	Mar. 7	11 38 1	2	1·5	0·90	82·5	82·4	82·5	30·127	121·54	A =83
		14 33 22	31	26·5	0·31	82·7	82·6	82·7	30·103	...	D =75
11	Mar. 7	2 40 10	12	11·0	0·94	82·7	82·6	82·7	30·103	121·54	A =83
		5 0 24	31	27·5	0·41	83·2	83·0	83·2	30·105	...	D =74
12	Mar. 8	5 18 2	4	3·0	0·89	80·6	80·5	80·6	30·117	121·59	A =81
		7 38 30	39	34·5	0·39	81·3	81·3	81·3	30·119	...	D =74

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Appendix. Table V.—Ascension Island.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers.			Barometer.	Rate.	Hygrom.
						Upper.	Middle.	Lower.			
		h m s	s	s	°	°	°	°		s	°
13	Mar. 8	7 42 17	18	17·5	0·99	81·3	81·3	81·3	30·119	121·59	A =82
		11 5 50	59	54·5	0·30	81·9	81·8	81·9	30·120	...	D =75
14	Mar. 8	11 8 43	44	43·5	0·91	82·0	81·9	82·0	30·120	121·59	A =84
		14 11 4	12	8·0	0·31	82·6	82·5	82·6	30·112	...	D =75
15	Mar. 8	2 15 15	16	15·5	0·93	82·6	82·5	82·6	30·112	121·59	A =83
		4 49 29	37	33·0	0·39	82·5	82·4	82·5	30·113	...	D =75
16	Mar. 9	5 9 21	22	21·5	0·95	81·0	80·9	81·0	30·121	121·59	A =81
		8 25 56	65	60·5	0·30	81·7	81·6	81·7	30·141	...	D =73
17	Mar. 9	8 29 3	5	4·0	0·93	81·8	81·7	81·8	30·141	121·59	A =82
		11 24 24	31	27·5	0·33	82·5	82·5	82·5	30·133	...	D =76
18	Mar. 9	11 28 17	19	18·0	0·90	82·5	82·5	82·5	30·133	121·59	A =83
		14 23 32	39	35·5	0·31	83·0	82·9	82·9	30·116	...	D =76
19	Mar. 9	2 27 47	50	48·5	0·78	83·0	82·9	82·9	30·116	121·59	A =84
		4 40 58	65	61·5	0·36	82·6	82·5	82·6	30·113	...	D =77
				Pendulum No. 11.							
1	Feb. 27	5 27 52	56	54·0	0·92	81·4	81·2	81·2	30·125	121·88	A =82
		8 7 38	50	44·0	0·35	81·5	81·5	81·5	30·127	...	D =74
2	Feb. 27	8 13 2	5	3·5	0·90	81·5	81·5	81·5	30·127	121·88	A =82
		11 1 57	71	64·0	0·32	82·5	82·5	82·5	30·125	...	D =74
3	Feb. 27	11 6 49	52	50·5	0·90	82·5	82·5	82·5	30·125	121·88	A =84
		14 33 8	27	17·5	0·23	83·0	82·8	83·0	30·095	...	D =74
4	Feb. 27	2 38 59	62	60·5	0·93	83·0	82·8	82·9	30·095	121·88	A =85
		5 27 43	62	52·5	0·32	83·0	82·8	83·0	30·111	...	D =74
5	Feb. 28	5 18 5	9	7·0	0·92	81·2	81·0	81·2	30·133	121·47	A =81
		8 35 25	41	33·0	0·29	81·7	81·6	81·8	30·151	...	D =75
6	Feb. 28	8 40 45	49	47·0	0·94	81·8	81·7	81·9	30·151	121·47	A =82
		11 39 0	13	6·5	0·31	82·9	82·9	82·9	30·151	...	D =75
7	Feb. 28	11 43 41	44	42·5	0·91	83·4	83·4	83·4	30·151	121·47	A =84
		14 41 46	60	53·0	0·30	82·9	82·7	82·8	30·134	...	D =74
8	Feb. 28	2 47 7	10	8·5	0·95	82·9	82·8	82·9	30·134	121·47	A =84
		5 26 31	46	38·5	0·36	82·6	82·5	82·6	30·131	...	D =74
9	Mar. 1	5 12 1	4	2·5	0·93	81·2	81·0	81·2	30·135	122·08	A =81
		8 10 29	42	35·5	0·31	81·6	81·5	81·6	30·151	...	D =74

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APPENDIX. TABLE V.—Ascension Island.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
10	Mar. 1	8 13 51	54	52·5	0·93	81·6	81·5	81·6	30·151	122·08	A =82
		11 40 15	32	23·5	0·27	82·6	82·5	82·6	30·143	...	D =75
11	Mar. 1	11 44 16	20	18·0	0·93	82·7	82·6	82·7	30·143	122·08	A =83
		14 42 22	37	29·5	0·31	83·0	82·9	83·0	30·123	...	D =74
12	Mar. 1	2 47 1	4	2·5	0·92	83·1	83·0	83·1	30·123	122·08	A =83
		5 26 25	42	33·5	0·34	82·6	82·6	82·6	30·129	...	D =74
13	Mar. 2	5 7 18	23	20·5	0·93	80·9	80·8	81·0	30·145	121·58	A =81
		8 24 37	51	44·0	0·29	81·5	81·4	81·5	30·155	...	D =74
14	Mar. 2	8 28 50	53	51·5	0·97	81·5	81·4	81·5	30·155	121·58	A =82
		11 36 24	38	31·0	0·31	82·6	82·5	82·6	30·145	...	D =74
15	Mar. 2	11 41 7	9	8·0	0·98	82·6	82·5	82·6	30·145	121·58	A =83
		14 57 52	67	59·5	0·29	83·4	83·3	83·4	30·115	...	D =75
16	Mar. 2	3 1 27	30	28·5	0·92	83·5	83·4	83·5	30·115	121·58	A =83
		5 21 57	72	64·5	0·39	83·0	82·9	83·0	30·118	...	D =74
17	Mar. 3	5 12 14	20	17·0	0·91	81·2	81·0	81·2	30·145	121·79	A =81
		8 38 53	69	61·0	0·26	81·5	81·5	81·6	30·180	...	D =75
18	Mar. 3	8 43 56	58	57·0	0·93	81·6	81·6	81·6	30·180	121·79	A =82
		11 42 4	18	11·0	0·32	82·8	82·7	82·8	30·145	...	D =74
19	Mar. 3	11 47 33	36	34·5	0·95	82·8	82·7	82·9	30·145	121·79	A =83
		14 55 0	14	7·0	0·30	83·3	83·2	83·3	30·132	...	D =75
20	Mar. 3	2 58 59	62	60·5	0·90	83·5	83·4	83·5	30·132	121·79	A =83
		5 19 35	49	42·0	0·38	83·0	82·8	82·9	30·127	...	D =74
21	Mar. 4	5 6 41	44	42·5	0·97	80·8	80·7	80·9	30·140	121·87	A =81
		8 34 15	32	23·5	0·26	81·5	81·5	81·5	30·163	...	D =74
22	Mar. 4	8 38 45	48	46·5	0·93	81·5	81·5	81·5	30·163	121·87	A =82
		11 37 45	60	52·5	0·30	82·2	82·2	82·2	30·147	...	D =74
23	Mar. 4	11 42 25	29	27·0	0·91	82·4	82·4	82·4	30·147	121·87	A =82
		15 9 48	65	56·5	0·25	81·8	81·7	81·7	30·125	...	D =74
24	Mar. 4	3 21 55	58	56·5	0·93	82·2	82·2	82·2	30·125	121·87	A =82
		5 14 23	33	28·0	0·48	81·6	81·5	81·6	30·127	...	D =74
25	Mar. 12	1 12 54	57	55·5	0·91	..	83·0	..	30·098	121·60	A =83
		3 23 54	65	59·5	0·40	..	82·5	..	30·090	...	D =74
26	Mar. 13	5 19 50	53	51·5	0·90	..	81·0	..	30·121	121·60	A =81
		8 27 30	45	37·5	0·295	..	81·7	..	30·133	...	D =74

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Appendix. Table V.—Ascension Island.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
				Iron Pendulum		(Knife	edge	A).			
		h m s	s	s	°	°	°	°		s	°
1	Mar. 25	5 17 20	27	23·5	1·11	82·1	..	82·1	30·075	3·25	A =82
		8 14 31	50	40·5	0·27	82·8	..	82·6	30·101	...	D =74
2	Mar. 25	8 29 10	16	13·0	1·12	82·9	..	82·7	30·101	3·25	A =83
		11 0 11	28	19·5	0·34	83·7	..	83·4	30·097	...	D =75
3	Mar. 25	11 5 5	10	7·5	1·12	83·9	..	83·5	30·097	3·25	A =84
		13 44 40	60	50·0	0·31	84·1	..	83·7	30·060	...	D =75
4	Mar. 25	1 48 51	56	53·5	1·12	84·2	..	83·8	30·060	3·25	A =84
		4 37 0	30	15·0	0·30	84·0	..	83·4	30·065	...	D =75
5	Mar. 26	4 53 30	38	34·0	1·10	82·1	..	82·0	30·117	2·71	A =82
		7 24 14	32	23·0	0·33	82·2	..	82·2	30·139	...	D =74
6	Mar. 26	8 17 5	9	7·0	1·12	82·7	..	82·7	30·109	2·71	A =83
		10 57 0	19	9·5	0·32	83·8	..	83·5	30·127	...	D =75
7	Mar. 26	11 11 3	8	5·5	1·12	83·9	..	83·6	30·127	2·71	A =84
		13 41 47	68	57·5	0·34	84·1	..	83·8	30·081	...	D =75
8	Mar. 26	1 46 28	34	31·0	1·12	84·2	..	83·8	30·081	2·71	A =84
		4 16 56	77	66·5	0·34	84·1	..	83·6	30·100	...	D =75
9	Mar. 29	11 20 17	23	20·0	1·09	83·5	..	83·6	30·111	2·97	A =83
		14 8 59	80	69·5	0·28	83·7	..	83·4	30·081	...	D =75
10	Mar. 29	2 16 43	49	46·0	1·10	83·8	..	83·7	30·081	2·97	A =83
		4 20 52	72	62·0	0·38	83·7	..	83·4	30·083	...	D =76
				(Knife	edge	B.)					
1	Mar. 27	5 16 3	11	7·0	1·08	82·1	..	82·0	30·127	3·10	A =83
		8 4 27	48	37·5	0·29	82·5	..	82·5	30·150	...	D =73
2	Mar. 27	8 9 19	26	22·5	1·12	82·5	..	82·5	30·150	3·10	A =84
		10 49 11	28	19·5	0·33	83·3	..	83·2	30·135	...	D =74
3	Mar. 27	10 58 26	30	28·0	1·16	83·4	..	83·3	30·135	3·10	A =84
		13 46 50	72	61·0	0·31	84·2	..	83·8	30·100	...	D =74
4	Mar. 27	1 50 34	37	35·5	1·20	84·3	..	83·8	30·100	3·10	A =83
		4 29 57	80	68·5	0·33	84·0	..	83·5	30·102	...	D =75
5	Mar. 28	4 49 49	55	52·0	1·08	82·1	..	81·9	30·113	3·18	A =81
		7 38 23	40	31·5	0·26	82·0	..	82·1	30·129	...	D =73
6	Mar. 28	7 55 26	30	28·0	1·10	82·1	..	82·1	30·129	3·18	A =83
		10 26 30	47	38·5	0·34	83·1	..	83·0	30·125	...	D =75

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APPENDIX. TABLE V.—Ascension Island.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
7	Mar. 28	10 30 18	24	21·0	1·17	83·1	..	83·0	30·125	3·18	A =84
		13 1 8	24	16·0	0·36	84·0	..	83·6	30·101	...	D =76
8	Mar. 29	4 52 32	38	35·0	1·10	81·9	..	81·7	30·113	2·97	A =82
		7 23 18	34	26·0	0·34	82·1	..	82·1	30·110	...	D =73
9	Mar. 29	8 26 11	14	12·5	1·20	82·7	..	82·5	30·111	2·97	A =83
		10 57 17	32	24·5	0·36	83·5	..	83·0	30·111	...	D =75
			Copper Pendulum (Knife edge A).								
1	Mar. 18	8 24 14	17	15·5	1·19	82·0	..	81·8	30·095	3·27	A =82
		10 57 37	54	45·5	0·37	82·7	..	82·5	30·091	...	D =74
2	Mar. 18	11 20 10	15	12·5	1·06	82·8	..	82·5	30·091	3·27	A =83
		14 38 17	39	28·0	0·26	83·5	..	83·0	30·067	...	D =77
3	Mar. 18	2 43 38	45	41·5	1·01	83·5	..	82·8	30·065	3·27	A =83
		4 40 30	48	39·0	0·42	83·6	..	83·0	30·062	...	D =74
4	Mar. 19	5 26 22	27	24·5	1·15	81·5	..	81·2	30·063	3·22	A =82
		7 59 29	44	36·5	0·37	81·8	..	81·8	30·063	...	D =75
5	Mar. 19	8 7 11	14	12·5	1·21	81·9	..	81·8	30·063	3·22	A =83
		10 40 31	44	37·5	0·39	82·5	..	82·3	30·063	...	D =75
6	Mar. 19	10 54 21	24	22·5	1·12	82·5	..	82·3	30·063	3·22	A =82
		13 36 39	56	47·5	0·34	82·6	..	82·6	30·027	...	D =74
7	Mar. 19	1 40 54	57	55·5	1·14	82·6	..	82·6	30·027	3·22	A =82
		4 22 57	76	66·5	0·34	82·6	..	82·3	30·031	...	D =75
8	Mar. 20	5 24 35	39	37·0	1·16	81·0	..	81·0	30·090	3·34	A =81
		7 57 54	68	61·0	0·38	81·6	..	81·7	30·100	...	D =74
9	Mar. 20	8 11 22	25	23·5	1·13	81·6	..	81·6	30·100	3·34	A =82
		10 45 2	16	9·0	0·37	82·9	..	82·6	30·101	...	D =75
10	Mar. 20	10 50 10	15	12·5	1·16	83·0	..	82·7	30·101	3·34	A =83
		13 41 37	52	44·5	0·32	83·5	..	83·0	30·091	...	D =75
11	Mar. 20	1 57 14	18	16·0	1·13	83·6	..	83·3	30·091	3·34	A =83
		4 30 15	34	24·5	0·36	83·8	..	83·0	30·083	...	D =75
12	Mar. 24	8 37 13	16	14·5	1·14	82·5	..	82·5	30·100	3·08	A =83
		11 19 31	47	39·0	0·35	83·1	..	82·9	30·089	...	D =75
13	Mar. 24	11 23 40	46	43·0	1·02	83·1	..	82·9	30·089	3·08	A =83
		13 56 45	60	52·5	0·32	83·6	..	83·3	30·035	...	D =76

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Appendix. Table V.—Ascension Island.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
14	Mar. 24	2 2 17	23	20·0	1·11	83·7	..	83·4	30·035	3·08	A =84
		4 35 8	29	18·5	0·36	83·6	..	83·0	30·031	...	D =75
				(Knife	edge	B.)					
1	Mar. 21	5 18 11	15	13·0	1·11	81·3	..	81·3	30·100	2·79	A =81
		7 59 41	57	49·0	0·36	81·9	..	81·8	30·100	...	D =74
2	Mar. 21	8 4 6	9	7·5	1·11	82·0	..	81·9	30·100	2·79	A =82
		10 54 51	66	58·5	0·34	83·0	..	82·7	30·101	...	D =76
3	Mar. 21	11 7 52	55	53·5	1·11	83·0	..	82·8	30·101	2·79	A =83
		13 40 16	31	23·5	0·38	83·9	..	83·4	30·077	...	D =76
4	Mar. 21	1 44 40	45	42·5	1·11	84·0	..	83·5	30·077	2·79	A =84
		4 25 49	69	59·0	0·35	83·9	..	83·4	30·076	...	D =76
5	Mar. 22	5 17 31	34	32·5	1·12	81·9	..	81·6	30·113	2·67	A =82
		8 7 57	69	63·0	0·34	82·0	..	81·9	30·119	...	D =74
6	Mar. 22	8 13 17	20	18·5	1·18	82·0	..	81·9	30·119	2·67	A =83
		10 54 47	61	54·0	0·36	83·1	..	82·9	30·115	...	D =76
7	Mar. 22	10 59 27	30	28·5	1·11	83·1	..	82·9	30·115	2·67	A =84
		13 49 32	50	41·0	0·34	83·9	..	83·5	30·103	...	D =74
8	Mar. 22	2 0 12	15	13·5	1·22	84·1	..	83·7	30·103	2·67	A =84
		4 41 8	31	19·5	0·39	84·0	..	83·4	30·101	...	D =76
9	Mar. 23	5 25 2	4	3·0	1·22	81·8	..	81·6	30·115	2·64	A =82
		8 15 8	23	15·5	0·37	82·3	..	82·2	30·121	...	D =74
10	Mar. 23	8 19 43	47	45·0	1·22	82·3	..	82·2	30·121	2·64	A =83
		10 52 6	19	12·5	0·41	83·1	..	82·9	30·113	...	D =75
11	Mar. 23	11 4 50	53	51·5	1·20	83·1	..	82·9	30·113	2·64	A =
		13 46 3	18	10·5	0·39	83·9	..	83·5	30·061	...	D =
12	Mar. 23	1 50 14	18	16·0	1·22	84·0	..	83·6	30·061	2·64	A =84
		4 40 13	37	25·0	0·36	83·6	..	83·0	30·061	...	D =73
13	Mar. 24	5 25 7	11	9·0	1·10	81·9	..	81·6	30·079	3·08	A =82
		8 15 15	31	23·0	0·34	82·2	..	82·1	30·095	...	D =74
				Pendulum	No. 10.	(*at the*	*Green*	*Mountain.*)		—	
1	April 9	12 17 40	41	40·5	0·96	75·4	..	75·3	27·861	126·82	A =74
		14 52 7	11	9·0	0·41	76·5	..	76·2	27·841	...	D =72

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APPENDIX. TABLE V.—Ascension Island.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
2	April 9	2 55 4	6	5·0	0·91	76·5	..	76·2	27·841	126·82	A =76
		5 29 33	41	37·0	0·37	75·5	..	75·5	27·850	...	D =73
3	April 10	6 25 0	1	0·5	0·92	72·0	..	72·0	27·841	126·82	A =72
		9 6 53	59	56·0	0·37	73·1	..	73·0	27·852	...	D =70
4	April 10	9 9 52	53	52·5	0·94	73·1	..	73·0	27·861	126·82	A =73
		11 58 36	42	39·0	0·35	75·5	..	75·2	27·853	...	D =71
5	April 10	0 10 52	53	52·5	0·90	75·5	..	75·4	27·853	126·82	A =75
		2 45 21	27	24·0	0·37	77·0	..	76·8	27·830	...	D =73
6	April 10	2 48 52	53	52·5	0·93	77·0	..	76·8	27·830	126·82	A =76
		5 16 15	22	18·5	0·39	76·0	..	75·8	27·833	...	D =73
7	April 11	5 53 1	3	2·0	0·90	72·1	..	72·1	27·851	126·82	A =72
		8 27 52	59	55·5	0·39	72·5	..	72·5	27·876	...	D =70
8	April 11	8 30 46	48	47·0	0·91	72·5	..	72·5	27·876	126·82	A =72
		11 12 32	38	35·0	0·35	74·5	..	74·5	27·885	...	D =71
9	April 11	11 48 59	60	59·5	0·90	75·0	..	75·0	27·875	126·82	A =76
		14 30 26	33	29·5	0·36	76·2	..	75·8	27·850	...	D =73
10	April 11	2 35 24	25	24·5	0·92	76·4	..	76·0	27·850	126·82	A =76
		5 9 48	55	51·5	0·38	75·4	..	75·1	27·863	...	D =73
11	April 12	5 56 56	57	56·5	0·91	72·4	..	72·4	27·891	127·47	A =72
		8 31 45	51	48·0	0·37	72·7	..	72·6	....	...	D =71
12	April 12	8 34 21	23	22·0	0·87	72·8	..	72·8	27·901	127·47	A =73
		11 9 4	11	7·5	0·36	74·4	..	74·3	27·920	...	D =72
13	April 12	11 23 2	3	2·5	0·90	74·9	..	74·7	27·920	127·47	A =74
		2 4 32	37	34·5	0·35	77·0	..	76·5	27·861	...	D =72
14	April 12	2 7 14	15	14·5	0·89	77·2	..	76·7	27·866	127·47	A =77
		4 55 38	45	41·5	0·34	76·5	..	76·0	27·852	...	D =73
15	April 13	5 53 28	29	28·5	0·94	73·0	..	73·0	27·900	126·33	A =73
		8 28 11	17	14·0	0·39	73·5	..	73·5	27·921	...	D =72
16	April 13	8 37 30	33	31·5	0·90	73·8	..	73·8	27·921	126·33	A =74
		11 19 8	15	11·5	0·35	74·5	..	74·5	27·911	...	D =73
17	April 13	11 38 6	7	6·5	0·91	74·5	..	74·5	27·909	126·33	A =74
		14 12 36	43	39·5	0·37	75·6	..	75·5	27·855	...	D =73
18	April 13	2 15 38	41	39·5	0·89	75·8	..	75·7	27·855	126·33	A =76
		5 25 6	22	14·0	0·29	74·9	..	74·8	27·851	...	D =74

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Appendix. Table V.—Ascension Island.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
19	April 14	5 52 34	38	36·0	0·90	72·9	..	72·9	27·863	126·33	A =73
		8 27 16	22	19·0	0·37	73·2	..	73·2	27·893	...	D =73
20	April 14	8 30 2	3	2·5	0·93	73·2	..	73·2	27·896	126·33	A =73
		11 32 44	51	47·5	0·32	74·6	..	74·6	27·876	...	D =73
		Fernando de Noronha.									
		Pendulum No. 10.								—	
1	June 22	6 27 12	14	13·0	0·87	79·8	79·8	79·8	30·000	101·71	A =80
		8 48 3	9	6·0	0·37	80·4	80·4	80·5	30·021	...	D =76
2	June 22	9 2 7	8	7·5	0·92	80·5	80·5	80·6	30·021	101·71	A =81
		11 29 35	42	38·5	0·38	81·2	81·2	81·2	30·027	...	D =76
3	June 22	0 13 14	15	14·5	0·92	81·2	81·0	81·2	30·016	101·71	A =81
		2 47 19	25	22·0	0·37	81·9	81·9	82·1	29·992	...	D =77
4	June 22	2 55 42	44	43·0	0·90	82·1	82·0	82·2	29·996	101·71	A =82
		5 36 23	32	27·5	0·34	82·4	82·3	82·5	30·000	...	D =77
5	June 23	6 26 41	43	42·0	0·90	79·8	79·8	79·9	30·000	101·98	A =80
		8 54 17	22	19·5	0·38	80·0	79·9	80·1	30·020	...	D =76
6	June 23	8 59 8	9	8·5	0·90	80·0	80·0	80·2	30·020	101·98	A =80
		11 26 41	48	44·5	0·37	80·5	80·5	80·6	30·015	...	D =77
7	June 23	0 11 35	36	35·5	0·91	80·7	80·7	80·8	30·010	101·98	A =81
		2 32 21	26	23·5	0·39	81·5	81·5	81·6	29·970	...	D =76
8	June 23	2 40 36	37	36·5	0·87	81·6	81·7	81·8	29·970	101·98	A =82
		5 7 59	66	62·5	0·37	82·0	82·0	82·2	29·975	...	D =76
9	June 24	6 18 56	57	56·5	0·92	79·7	79·7	79·7	29·991	102·22	A =80
		8 46 27	34	30·5	0·39	80·0	80·1	80·3	30·011	...	D =76
10	June 24	8 57 46	47	46·5	0·91	80·3	80·4	80·4	30·017	102·22	A =80
		11 25 15	22	18·5	0·39	80·8	80·9	81·0	30·008	...	D =77
11	June 24	0 6 2	3	2·5	0·88	81·0	81·0	81·2	29·999	102·22	A =82
		2 46 53	58	55·5	0·35	82·4	82·4	82·5	29·943	...	D =77
12	June 24	2 50 48	49	48·5	0·90	82·5	82·5	82·5	29·943	102·22	A =83
		5 18 7	13	10·0	0·38	82·5	82·5	82·5	29·953	...	D =79
13	June 25	6 25 6	7	6·5	0·94	80·4	80·4	80·5	29·977	102·03	A =80
		8 52 35	40	37·5	0·40	80·6	80·7	81·0	30·012	...	D =77

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APPENDIX. TABLE V.—Fernando de Noronha.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
14	June 25	8 56 20	21	20·5	0·92	80·8	80·8	81·0	30·012	102·03	A =82
		11 30 29	36	32·5	0·38	81·5	81·6	81·8	30·013	...	D =78
15	June 25	0 7 48	49	48·5	0·93	81·6	81·7	81·9	30·001	102·03	A =83
		2 48 33	38	35·5	0·37	82·8	82·8	82·9	29·965	...	D =79
16	June 25	2 52 31	32	31·5	0·91	83·1	83·2	83·3	29·965	102·03	A =83
		5 19 45	52	48·5	0·39	82·9	82·9	83·0	29·970	...	D =80
17	June 26	6 24 6	7	6·5	0·93	80·0	80·0	80·1	29·969	102·18	A =80
		8 51 38	44	41·0	0·39	80·1	80·2	80·4	30·018	...	D =75
18	June 26	8 55 53	54	53·5	0·87	80·2	80·3	80·4	30·018	102·18	A =80
		11 23 27	34	30·5	0·37	80·4	80·5	80·6	30·017	...	D =77
19	June 26	0 5 48	49	48·5	0·90	80·5	80·5	80·6	30·009	102·18	A =82
		2 33 19	26	22·5	0·38	81·4	81·4	81·5	29·960	...	D =79
20	June 26	2 41 2	3	2·5	0·94	81·4	81·4	81·5	29·960	102·18	A =82
		5 8 27	34	30·5	0·39	81·6	81·6	81·7	29·980	...	D =79
21	June 27	6 7 50	53	51·5	0·93	79·4	79·3	79·4	30·016	102·59	A =79
		8 42 15	21	18·0	0·38	79·1	79·2	79·3	30·049	...	D =75
				Pendulum No. 11.							
1	June 27	3 18 22	25	23·5	0·89	81·9	82·0	82·1	29·990	102·59	A =82
		5 48 25	41	33·0	0·36	81·6	81·6	81·6	30·006	...	D =79
2	June 28	6 4 12	17	14·5	0·92	79·5	79·5	79·7	30·009	102·71	A =80
		8 34 35	44	39·5	0·37	80·0	80·1	80·3	30·037	...	D =76
3	June 28	8 47 56	59	57·5	0·90	80·1	80·3	80·4	30·037	102·71	A =80
		11 18 13	22	17·5	0·36	80·9	81·0	81·2	30·029	...	D =77
4	June 28	0 2 58	61	59·5	0·90	81·2	81·3	81·4	30·020	102·71	A =81
		2 42 1	10	5·5	0·34	81·5	81·5	81·6	29·990	...	D =78
5	June 28	2 46 31	33	32·0	0·92	81·6	81·7	81·8	29·990	102·71	A =82
		5 16 35	44	39·5	0·37	82·1	82·2	82·3	29·991	...	D =78
6	June 29	6 17 16	20	18·0	0·92	79·8	79·8	79·9	29·991	102·51	A =79
		9 5 19	30	24·5	0·32	80·0	80·1	80·3	30·030	...	D =77
7	June 29	9 9 58	60	59·0	0·91	80·2	80·3	80·3	30·030	102·51	A =80
		11 40 15	24	19·5	0·37	80·4	80·6	80·8	30·011	...	D =77
8	June 29	0 7 50	52	51·0	0·89	80·5	80·7	81·0	30·011	102·51	A =81
		2 46 55	66	60·5	0·34	81·4	81·4	81·6	29·975	...	D =78

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Appendix. Table V.—Fernando de Noronha.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
9	June 29	2 51 39	41	40·0	0·92	81·6	81·8	82·0	29·975	102·51	A =82
		5 21 45	54	49·5	0·37	81·5	81·5	81·6	29·999	...	D =77
10	June 30	5 57 15	21	18·0	0·92	79·4	79·4	79·4	29·982	102·00	A =80
		8 36 34	44	39·0	0·36	79·4	79·5	79·7	30·013	...	D =76
11	June 30	8 40 50	53	51·5	9·92	79·6	79·6	79·8	30·013	102·00	A =81
		11 28 55	64	59·5	0·34	80·4	80·5	80·7	30·011	...	D =76
12	June 30	0 0 10	13	11·5	0·91	80·5	80·5	80·7	30·007	102·00	A =
		2 30 25	34	29·5	0·36	81·4	81·4	81·6	29·973	...	D =
13	June 30	2 35 8	11	9·5	0·90	81·5	81·6	81·8	29·973	102·00	A =82
		5 5 15	26	20·5	0·36	81·4	81·4	81·4	29·991	...	D =77
14	July 1	6 11 6	10	8·0	0·89	79·3	79·4	79·5	30·000	102·69	A =79
		8 41 29	40	34·5	0·35	79·8	79·8	80·0	30·025	...	D =75
15	July 1	8 45 49	51	50·0	0·92	79·8	79·9	80·0	30·025	102·69	A =80
		11 16 7	16	11·5	0·37	80·5	80·6	80·8	30·026	...	D =75
16	July 1	11 57 14	17	15·5	0·91	80·7	80·8	80·9	30·014	102·69	A =81
		14 27 25	34	29·5	0·37	81·6	81·6	81·6	29·971	...	D =76
17	July 1	2 32 9	11	10·0	0·90	81·6	81·6	81·6	29·971	102·69	A =82
		5 11 1	12	6·5	0·35	82·0	82·0	82·0	29·986	...	D =77
18	July 2	6 17 58	61	59·5	0·93	79·4	79·4	79·4	30·016	102·69	A =79
		8 48 17	28	22·5	0·38	79·7	79·7	79·9	30·055	...	D =74
					Maranham.						
					Pendulum No. 10.					—	
1	Aug. 4	6 9 41	43	42·0	0·87	81·6	81·6	81·8	30·072	113·43	A =81
		8 42 59	66	62·5	0·35	81·8	81·8	82·0	30·100	...	D =79
2	Aug. 4	8 47 0	1	0·5	0·90	81·9	81·9	82·0	30·100	113·43	A =82
		11 20 15	22	18·5	0·36	82·0	82·0	82·1	30·111	...	D =79
3	Aug. 4	11 24 9	11	10·0	0·89	82·0	82·0	82·1	30·111	113·43	A =83
		13 57 19	28	23·5	0·36	82·4	82·4	82·5	30·080	...	D =80
4	Aug. 4	2 2 12	13	12·5	0·90	82·5	82·5	82·5	30·080	113·43	A =83
		4 35 23	30	26·5	0·36	82·4	82·4	82·6	30·056	...	D =79
5	Aug. 5	6 7 46	49	47·5	0·89	81·9	81·9	82·0	30·069	113·61	A =82
		8 41 3	10	6·5	0·36	82·1	82·1	82·3	30·096	...	D =79

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APPENDIX. TABLE V.—Maranham.

No.	1830.	Disappearance	Reap.	Coincid	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
6	Aug. 5	8 45 14	15	14·5	0·89	82·2	82·2	82·4	30·096	113·61	A =83
		11 18 27	36	31·5	0·36	82·4	82·4	82·5	30·092	...	D =80
7	Aug. 5	11 23 23	25	24·0	0·90	82·4	82·4	82·5	30·092	113·61	A =82
		13 56 35	43	39·0	0·36	82·6	82·6	82·8	30·050	...	D =80
8	Aug. 5	2 0 32	34	33·0	0·87	82·6	82·8	82·9	30·050	113·61	A =83
		4 40 23	32	27·5	0·34	82·8	82·6	82·7	30·018	...	D =80
9	Aug. 6	6 10 26	30	28·0	0·82	81·9	81·9	82·1	30·020	113·52	A =82
		8 37 3	10	6·5	0·36	82·0	82·0	82·2	30·060	...	D =80
10	Aug. 6	8 40 46	47	46·5	0·90	82·1	82·1	82·3	30·060	113·52	A =83
		11 13 57	63	60·0	0·37	82·5	82·5	82·6	30·059	...	D =80
11	Aug. 6	11 18 30	32	31·0	0·90	82·5	82·5	82·6	30·059	113·52	A =83
		13 51 37	44	40·5	0·37	82·8	82·8	83·0	30·010	...	D =80
12	Aug. 6	1 55 16	18	17·0	0·90	82·9	82·9	83·1	30·010	113·52	A =83
		4 28 23	30	26·5	0·37	82·7	82·7	83·0	29·978	...	D =79
13	Aug. 7	6 7 25	28	26·5	0·87	82·0	82·0	82·1	30·027	113·14	A =82
		8 40 39	48	43·5	0·36	82·0	82·0	82·2	30·059	...	D =80
14	Aug. 7	8 44 37	39	38·0	0·89	82·0	82·0	82·2	30·059	113·14	A =83
		11 17 49	58	53·5	0·36	82·3	82·3	82·4	30·073	...	D =81
15	Aug. 7	11 28 35	38	36·5	0·88	82·3	82·3	82·4	30·071	113·14	A =83
		14 1 45	52	48·5	0·36	82·5	82·5	82·6	....	...	D =81
16	Aug. 7	2 6 2	3	2·5	0·86	82·6	82·6	82·7	30·018	113·14	A =83
		4 39 9	17	13·0	0·36	82·7	82·7	82·8	29·992	...	D =80
17	Aug. 8	6 18 19	21	20·0	0·90	81·6	81·6	81·7	30·063	113·62	A =82
		8 51 33	40	36·5	0·38	81·8	81·8	81·9	30·100	...	D =80
18	Aug. 8	9 40 29	30	29·5	0·93	81·8	81·8	82·1	30·101	113·62	A =83
		12 13 40	48	44·0	0·38	82·1	82·1	82·4	30·095	...	D =80
19	Aug. 8	0 18 5	6	5·5	0·90	82·2	82·2	82·4	30·095	113·62	A =83
		3 4 35	42	38·5	0·34	82·6	82·6	82·7	30·033	...	D =80
				Pendulum		No. 11.					
1	Aug. 9	6 10 48	53	50·5	0·91	82·0	82·0	82·1	30·058	113·85	A =82
		8 48 21	33	27·0	0·35	81·9	81·9	82·0	30·096	...	D =80
2	Aug. 9	8 52 41	43	42·0	0·91	82·0	82·0	82·1	30·096	113·85	A =83
		11 30 14	26	20·0	0·34	82·3	82·4	82·4	30·093	...	D =81

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Appendix. Table V.—Maranham.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
3	Aug. 9	11 35 33	36	34·5	0·91	82·4	82·4	82·5	30·095	113·85	A =83
		14 30 34	45	39·5	0·31	82·7	82·7	82·8	30·050	...	D =81
4	Aug. 9	2 37 39	40	39·5	0·90	82·7	82·7	82·8	30·050	113·85	A =83
		4 48 47	59	53·0	0·41	83·0	82·9	83·0	....	...	D =81
5	Aug. 10	6 1 53	57	55·0	0·91	82·0	82·0	82·1	30·023	113·82	A =82
		8 48 13	25	19·0	0·33	82·1	82·1	82·3	30·068	...	D =79
6	Aug. 10	8 52 47	50	48·5	0·90	82·5	82·4	82·6	30·068	113·82	A =83
		11 30 20	31	25·5	0·35	82·3	82·5	82·5	30·064	...	D =79
7	Aug. 10	11 33 49	52	50·5	0·91	82·5	82·5	82·6	30·064	113·82	A =83
		14 20 3	15	9·0	0·33	82·8	82·8	83·0	30·012	...	D =80
8	Aug. 10	2 27 47	50	48·5	0·90	82·8	82·8	83·0	30·012	113·82	A =83
		4 56 28	43	35·5	0·37	83·0	83·0	83·1	30·000	...	D =80
9	Aug. 11	6 36 59	62	60·5	0·91	82·3	82·3	82·4	30·058	113·42	A =83
		8 57 2	13	7·5	0·39	82·6	82·6	82·8	30·100	...	D =81
10	Aug. 11	9 1 33	36	34·5	0·88	82·6	82·6	82·8	30·100	113·42	A =83
		11 47 52	65	58·5	0·32	82·6	82·6	82·6	30·095	...	D =81
11	Aug. 11	11 52 45	46	45·5	0·90	82·7	82·7	82·8	30·095	113·42	A =83
		14 30 16	29	22·5	0·34	82·8	82·8	82·9	30·022	...	D =82
12	Aug. 11	2 34 35	36	35·5	0·91	82·9	82·9	83·0	30·022	113·42	A =84
		4 54 32	45	38·5	0·39	83·3	83·3	83·4	30·002	...	D =82
13	Aug. 12	6 11 15	18	16·5	0·90	82·6	82·6	82·6	30·071	113·42	A =83
		8 48 52	63	57·5	0·36	82·5	82·5	82·7	30·111	...	D =80
14	Aug. 12	8 53 3	4	3·5	0·87	82·6	82·6	82·7	30·111	113·42	A =83
		11 30 38	49	43·5	0·33	82·8	82·9	83·0	30·111	...	D =79
15	Aug. 12	11 35 21	22	21·5	0·92	82·9	82·9	83·0	30·111	113·42	A =
		14 21 37	50	43·5	0·34	83·0	83·0	83·1	30·052	...	D =
16	Aug. 12	2 25 36	38	37·0	0·89	83·0	83·0	83·2	30·052	113·42	A =84
		5 3 8	21	14·5	0·34	83·3	83·3	83·3	30·050	...	D =81
			Copper Pendulum			(Knife	edge	A.)		—	
1	Aug. 20	5 33 10	17	13·5	0·95	82·1	..	81·8	30·058	18·05	A =82
		8 7 25	46	35·5	0·29	82·0	..	82·0	30·102	...	D =80
2	Aug. 20	8 12 21	26	23·5	1·04	82·2	..	82·0	30·102	18·05	A =82
		10 55 45	68	56·5	0·31	82·0	..	82·0	30·111	...	D =80

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APPENDIX. TABLE V.—Maranham.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
3	Aug. 20	11 2 7	12	9·5	1·03	82·1	..	82·0	30·111	18·05	A =83
		13 45 22	43	32·5	0·31	82·3	...	82·1	30·053	...	D =80
4	Aug. 20	1 49 57	62	59·5	1·12	82·5	..	82·2	30·053	18·05	A =83
		4 14 52	71	61·5	0·37	82·3	..	82·1	30·022	...	D =80
5	Aug. 21	5 54 20	26	23·0	1·20	81·8	..	81·5	30·023	18·32	A =81
		8 28 24	41	32·5	0·36	81·8	..	81·6	30·067	...	D =80
6	Aug. 21	8 33 4	10	7·0	1·11	81·8	..	81·6	30·067	18·32	A =82
		11 7 23	42	32·5	0·34	81·8	..	81·7	30·058	...	D =80
7	Aug. 21	11 13 2	6	4·0	1·18	81·8	..	81·7	30·058	18·32	A =82
		13 47 8	28	18·0	0·36	82·0	..	81·8	30·015	...	D =80
8	Aug. 21	1 51 9	13	11·0	1·21	82·0	..	81·8	30·015	18·32	A =83
		4 34 14	37	25·5	0·34	82·6	..	82·2	29·991	...	D =80
9	Aug. 22	5 26 35	42	38·5	1·21	81·8	..	81·5	30·033	19·09	A =81
		8 1 19	38	28·5	0·35	81·9	..	81·6	30·052	...	D =79
10	Aug. 22	8 5 46	51	48·5	1·19	81·9	..	81·6	30·052	19·09	A =82
		11 8 3	24	13·5	0·28	82·0	..	81·8	30·050	...	D =80
11	Aug. 22	11 12 52	57	54·5	1·20	82·0	..	81·8	30·050	19·09	A =83
		13 47 23	46	34·5	0·35	82·3	..	82·1	30·000	...	D =81
12	Aug. 22	1 55 57	64	60·5	1·12	82·5	..	82·4	29·992	19·09	A =83
		4 30 9	32	20·5	0·34	82·9	..	82·5	29·989	...	D =81
13	Aug. 26	5 23 50	57	53·5	1·08	81·4	..	81·2	29·985	18·95	A =82
		7 58 17	38	27·5	0·33	81·5	..	81·3	30·031	...	D =79
14	Aug. 26	8 3 45	49	47·0	1·12	81·5	..	81·3	30·031	18·95	A =82
		10 38 17	36	26·5	0·34	81·6	..	81·5	30·031	...	D =79
15	Aug. 26	10 42 50	53	51·5	1·26	81·6	..	81·5	30·031	18·95	A =82
		13 17 6	26	16·0	0·38	81·9	..	81·7	29·992	...	D =79
16	Aug. 26	1 21 36	41	38·5	1·17	82·0	..	81·8	29·992	18·95	A =83
		3 55 49	70	59·5	0·35	82·1	..	82·0	29·984	...	D =80
				(Knife	edge	B.)					
1	Aug. 23	5 46 27	34	30·5	1·09	82·0	..	81·8	30·033	18·93	A =82
		8 28 46	65	55·5	0·34	82·1	..	82·0	30·071	...	D =80
2	Aug. 23	8 33 56	59	57·5	1·14	82·1	..	82·5	30·071	18·93	A =83
		11 7 22	38	30·0	0·37	82·1	..	82·0	30·068	...	D =80

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Appendix. Table V.—Maranham.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
3	Aug. 23	11 12 38	43	40·5	1·06	82·1	..	82·0	30·068	18·93	A =83
		13 45 58	76	67·0	0·36	82·4	..	82·2	30·033	...	D =81
4	Aug. 23	1 50 35	41	38·0	1·12	82·4	..	82·2	30·033	18·93	A =83
		4 23 49	72	60·5	0·35	82·9	..	82·5	30·020	...	D =81
5	Aug. 24	5 20 58	66	62·0	1·10	82·2	..	82·0	30·061	18·77	A =82
		7 54 17	36	26·5	0·37	82·3	..	82·0	30·085	...	D =80
6	Aug. 24	8 0 42	47	44·5	1·15	82·3	..	82·0	30·085	18·77	A =83
		10 34 7	24	15·5	0·38	82·5	..	82·2	30·100	...	D =80
7	Aug. 24	10 38 26	29	27·5	1·18	82·5	..	82·2	30·100	18·77	A =83
		13 47 58	78	68·0	0·31	82·5	..	82·2	30·057	...	D =80
8	Aug. 24	1 53 18	23	20·5	1·10	82·5	..	82·2	30·057	18·77	A =83
		4 26 40	62	51·0	0·36	82·8	..	82·5	30·049	...	D =80
9	Aug. 25	5 21 36	44	40·0	1·00	81·9	..	81·5	30·020	18·95	A =82
		7 55 10	27	18·5	0·34	81·6	..	81·3	30·063	...	D =80
10	Aug. 25	7 58 34	39	36·5	1·09	81·7	..	81·4	30·063	18·95	A =82
		10 32 6	24	15·0	0·36	81·9	..	81·7	30·070	...	D =80
11	Aug. 25	10 36 56	61	58·5	1·14	81·9	..	81·7	30·070	18·95	A =82
		13 37 34	55	44·5	0·31	81·9	..	81·6	30·020	...	D =80
12	Aug. 25	1 42 2	7	4·5	1·15	81·9	..	81·6	30·020	18·95	A =83
		4 24 23	44	33·5	0·36	82·1	..	82·1	30·000	...	D =80
					Para.						
					Pendulum No. 10.					—	
1	Sept. 23	2 18 2	4	3·0	0·88	83·7	83·7	83·9	30·013	110·03	A =84
		4 50 24	31	27·5	0·37	84·0	83·9	84·0	30·000	...	D =82
2	Sept. 24	6 5 17	18	17·5	0·91	82·5	82·5	82·5	30·049	109·75	A =82
		8 37 50	57	53·5	0·38	82·5	82·5	82·5	30·095	...	D =80
3	Sept. 24	8 46 49	50	49·5	0·88	82·5	82·5	82·5	30·095	109·75	A =83
		11 26 2	9	5·5	0·35	83·0	83·0	83·1	30·088	...	D =81
4	Sept. 24	11 37 3	3	3·0	0·91	83·1	83·1	83·2	30·088	109·75	A =83
		14 16 11	17	14·0	0·35	83·5	83·5	83·7	30·044	...	D =82
5	Sept. 24	2 23 33	34	33·5	0·88	83·5	83·5	83·8	30·042	109·75	A =84
		4 42 44	51	47·5	0·39	83·6	83·5	83·7	30·021	...	D =81

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APPENDIX. TABLE V.—Para.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
6	Sept. 25	6 9 11	12	11·5	0·84	82·3	82·1	82·3	30·052	109·93	A =82
		8 35 12	19	15·5	0·36	82·0	82·0	82·2	30·100	...	D =80
7	Sept. 25	8 38 27	28	27·5	0·87	82·2	82·1	82·2	30·102	109·93	A =82
		11 11 6	11	8·5	0·35	82·6	82·6	82·7	30·100	...	D =80
8	Sept. 25	11 21 26	27	26·5	0·87	82·7	82·7	82·8	30·100	109·93	A =83
		14 0 40	47	43·5	0·35	83·3	83·3	83·5	30·029	...	D =81
9	Sept. 25	2 4 0	0	0·0	0·90	83·3	83·3	83·5	30·029	109·93	A =84
		4 36 32	39	35·5	0·37	83·5	83·4	83·7	30·001	...	D =82
10	Sept. 26	6 3 23	23	23·0	0·89	82·4	82·3	82·4	30·052	110·10	A =82
		8 36 2	9	5·5	0·36	82·4	82·4	82·5	30·093	...	D =80
11	Sept. 26	8 44 26	26	26·0	0·89	82·5	82·4	82·6	30·093	110·10	A =82
		11 17 4	11	7·5	0·36	82·9	82·8	83·0	30·095	...	D =81
12	Sept. 26	11 25 25	26	25·5	0·87	82·9	82·8	83·1	30·095	110·10	A =83
		13 58 2	9	5·5	0·35	83·4	83·4	83·5	30·045	...	D =81
13	Sept. 26	2 12 53	54	53·5	0·89	83·7	83·6	83·6	30·045	110·10	A =84
		4 32 10	17	13·5	0·39	83·5	83·5	83·7	30·024	...	D =82
14	Sept. 27	6 6 52	52	52·0	0·90	82·2	82·0	82·0	30·065	110·10	A =82
		8 39 38	45	41·5	0·37	82·0	82·0	82·2	30·095	...	D =80
15	Sept. 27	8 48 3	4	3·5	0·88	82·2	82·0	82·2	30·093	110·10	A =83
		11 20 50	55	52·5	0·36	82·6	82·6	82·7	30·093	...	D =80
16	Sept. 27	11 29 24	24	24·0	0·85	82·6	82·7	82·8	30·093	110·10	A =83
		14 2 5	11	8·0	0·34	83·2	83·2	83·4	30·022	...	D =80
17	Sept. 27	2 9 34	34	34·0	0·88	83·4	83·4	83·6	30·022	110·10	A =84
		4 42 13	18	15·5	0·35	83·5	83·5	83·5	30·007	...	D =81
18	Sept. 28	6 12 33	34	33·5	0·84	82·5	82·4	82·5	30·049	110·10	A =82
		8 38 44	51	47·5	0·35	82·5	82·4	82·5	30·090	...	D =80
				Pendulum	No. 11.						
1	Sept. 18	6 26 9	11	10·0	0·97	82·2	82·2	82·4	30·063	109·37	A =82
		9 2 37	47	42·0	0·37	82·4	82·3	82·2	30·095	...	D =80
2	Sept. 18	9 11 57	59	58·0	0·91	82·3	82·3	82·4	30·096	109·37	A =83
		11 48 26	37	31·5	0·35	82·7	82·7	82·8	30·091	...	D =80
3	Sept. 18	0 2 28	29	28·5	0·91	82·9	82·9	82·9	30·091	109·37	A =83
		2 38 54	67	60·5	0·35	82·7	82·7	83·0	30·000	...	D =81

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Appendix. Table V.—Para.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
4	Sept. 18	2 48 58	61	59·5	0·89	83·0	82·9	83·1	30·000	109·37	A =83
		5 25 31	44	37·5	0·34	82·9	82·8	82·9	29·992	...	D =81
5	Sept. 19	6 18 9	11	10·0	0·93	81·9	81·9	81·9	30·051	109·75	A =82
		8 55 13	23	18·0	0·34	82·0	81·8	82·0	30·071	...	D =80
6	Sept. 19	9 3 6	8	7·0	0·90	82·0	81·9	82·0	30·071	109·75	A =82
		11 48 32	43	37·5	0·33	82·5	82·4	82·7	30·068	...	D =80
7	Sept. 19	0 3 8	9	8·5	0·93	82·6	82·7	83·0	30·062	109·75	A =83
		2 39 42	53	47·5	0·35	83·1	83·1	83·3	30·005	...	D =81
8	Sept. 19	2 50 34	35	34·5	0·92	83·3	83·3	83·4	30·005	109·75	A =84
		5 18 22	34	28·0	0·37	83·4	83·4	83·4	29·980	...	D =81
9	Sept. 20	6 12 1	3	2·0	0·91	82·2	81·9	82·1	30·050	109·57	A =82
		8 48 45	56	50·5	0·35	82·0	82·1	82·2	30·069	...	D =80
10	Sept. 20	9 1 32	33	32·5	0·93	82·2	82·3	82·4	30·068	109·57	A =82
		11 38 12	24	18·0	0·36	82·6	82·6	82·7	30·048	...	D =80
11	Sept. 20	11 54 22	23	22·5	0·93	82·7	82·7	83·0	30·048	109·57	A =83
		14 30 59	71	65·0	0·35	83·3	83·3	83·4	29·973	...	D =80
12	Sept. 20	2 40 6	7	6·5	0·93	83·3	83·2	83·4	29·963	109·57	A =84
		5 7 58	68	63·0	0·38	83·6	83·6	83·6	29·948	...	D =81
13	Sept. 21	6 10 32	35	33·5	0·92	82·5	82·5	82·6	30·015	109·53	A =82
		8 47 16	27	21·5	0·35	82·6	82·6	82·8	30·050	...	D =80
14	Sept. 21	8 55 52	54	53·0	0·92	82·6	82·6	82·8	30·050	109·53	A =82
		11 32 33	43	38·0	0·35	83·1	83·2	83·4	30·050	...	D =81
15	Sept. 21	11 51 36	38	37·0	0·93	83·3	83·3	83·4	30·049	109·53	A =83
		14 28 13	24	18·5	0·36	83·6	83·6	83·7	29·972	...	D =82
16	Sept. 21	2 50 2	5	3·5	0·89	83·7	83·7	83·7	29·972	109·53	A =84
		5 17 49	61	55·0	0·36	83·8	83·8	84·0	29·963	...	D =82
17	Sept. 22	6 9 42	43	42·5	0·94	82·5	82·5	82·6	30·011	109·68	A =82
		*8 55 4	14	9·0	0·35	82·6	82·6	82·8	30·060	...	D =80
18	Sept. 22	9 1 6	7	6·5	0·91	82·6	82·6	82·7	30·060	109·68	A =83
		11 37 45	55	50·0	0·35	83·2	83·2	83·4	30·050	...	D =81
19	Sept. 22	11 46 0	1	0·5	0·92	83·2	83·2	83·4	30·050	109·68	A =83
		14 22 33	43	38·0	0·36	83·6	83·6	83·9	29·972	...	D =82

* The last disappearance is stated to be $8^h\ 56^m\ 4^s$ in the original manuscript: but, on comparing the coincidence with the two preceding ones, it is evident that an error of one minute has been made in entering the time.—B.

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APPENDIX. TABLE V.—Para.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
20	Sept. 22	2 29 50	51	50·5	0·92	83·7	83·7	83·9	29·972	109·68	A =84
		4 57 36	47	41·5	0·37	84·1	84·0	84·2	29·952	...	D =82
21	Sept. 22	6 6 42	43	42·5	0·92	82·6	82·6	82·6	30·011	109·68	A =82
		8 43 22	33	27·5	0·36	82·5	82·5	82·8	30·061	...	D =81
22	Sept. 22	8 51 52	53	52·5	0·91	82·7	82·7	82·8	30·063	109·68	A =83
		11 28 36	45	40·5	0·35	83·2	83·1	83·3	30·055	...	D =81
				Iron Pe	ndulum	(Knife	edge	A).		—	
1	Sept. 25	5 17 0	9	4·5	1·02	83·0	..	82·6	30·052	20·93	A =82
		7 41 11	44	27·5	0·32	82·9	..	82·5	30·100	...	D =80
2	Sept. 25	7 44 28	37	32·5	1·14	82·9	..	82·5	30·102	20·93	A =82
		10 27 1	32	16·5	0·33	83·1	..	83·0	30·100	...	D =80
3	Sept. 25	10 31 14	21	17·5	1·12	83·1	..	83·0	30·100	20·93	A =83
		13 4 40	70	55·0	0·33	83·7	..	83·6	30·029	...	D =81
4	Sept. 25	1 12 40	48	44·0	1·14	83·8	..	83 6	30·029	20·93	A =84
		3 45 52	83	67·5	0·34	84·0	..	83·7	30·001	...	D =82
5	Sept. 26	5 15 2	11	6·5	1·16	83·1	..	82·9	30·050	21·08	A =82
		7 48 6	34	20·0	0·35	83·0	..	82·7	30·093	...	D =80
6	Sept. 26	7 56 0	9	4·5	1·12	83·0	..	82·8	30·093	21·08	A =82
		10 29 17	46	31·5	0·33	83·2	..	83·2	30·095	...	D =81
7	Sept. 26	10 37 32	39	35·5	1·17	83·2	..	83·2	30·095	21·08	A =83
		13 19 45	74	59·5	0·32	83·9	..	83·8	30·045	...	D =81
8	Sept. 26	1 24 48	57	52·5	1·09	83·9	..	83·8	30·045	21·08	A =84
		3 48 55	82	68·5	0·35	84·2	..	83·9	30·024	...	D =82
9	Sept. 27	5 19 20	29	24·5	1·13	82·8	..	82·6	30·065	20·49	A =82
		*7 52 47	76	61·5	0·34	82·7	..	82·5	30·095	...	D =80
10	Sept. 27	8 1 0	7	3·5	1·10	82·7	..	82·5	30·093	20·49	A =83
		10 34 41	72	56·5	0·33	83·0	..	82·8	30·093	...	D =80
11	Sept. 27	10 42 58	63	60·5	1·17	83·0	..	82·9	30·093	20·49	A =83
		13 16 31	60	45·5	0·35	83·6	..	83·6	30·022	...	D =80
12	Sept. 27	1 23 46	55	50·5	1·10	83·6	..	83·6	30·022	20·49	A =84
		3 57 9	42	25·5	0·32	84·0	..	83·8	30·007	...	D =81

* In the original manuscript book, the time of the last coincidence is $7^h\ 53^m\ 47^s$: but, on comparing it with the preceding ones, it is evident that a mistake of one minute has been committed in entering the same.—B.

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Appendix. Table V.—Para.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
				(Knife edge B.)							
		h m s	s	s	°	°	°	°		s	°
1	Sept. 28	5 19 21	28	24·5	1·16	83·1	..	82·7	30·049	19·90	A = 82
		7 53 43	73	58·0	0·34	83·0	..	82·8	30·090	...	D = 80
2	Sept. 28	8 1 38	45	41·5	1·12	83·0	..	82·8	30·092	19·90	A = 83
		10 36 17	42	29·5	0·32	83·3	..	83·0	30·081	...	D = 80
3	Sept. 28	10 50 34	41	37·5	1·10	83·3	..	83·0	30·078	19·90	A = 84
		13 25 13	42	27·5	0·32	84·1	..	83·8	30·011	...	D = 81
4	Sept. 28	1 30 50	57	53·5	1·10	84·1	..	83·8	30·011	19·90	A = 84
		3 56 28	57	42·5	0·34	84·3	..	84·0	30·000	...	D = 82
5	Sept. 29	5 23 35	43	39·0	1·10	82·9	..	82·6	30·000	19·90	A = 82
		8 7 16	48	32·0	0·29	82·8	..	82·5	30·064	...	D = 80
6	Sept. 29	8 10 54	60	57·0	1·19	82·7	..	82·5	30·064	19·90	A = 83
		11 4 4	34	19·0	0·30	83·0	..	82·8	30·039	...	D = 81
7	Sept. 29	11 8 6	14	10·0	1·10	83·0	..	82·8	30·039	19·90	A = 84
		13 42 49	79	64·0	0·32	83·6	..	83·4	29·963	...	D = 82
8	Sept. 29	1 47 35	41	38·0	1·12	83·6	..	83·4	29·963	19·90	A = 84
		4 13 5	34	19·5	0·34	83·8	..	83·5	29·975	...	D = 81
9	Sept. 30	5 5 1	10	5·5	1·18	82·5	..	82·3	30·043	19·90	A = 82
		7 39 37	64	50·5	0·34	82·5	..	82·2	30·100	...	D = 80
10	Sept. 30	7 43 48	55	51·5	1·13	82·5	..	82·3	30·100	19·90	A = 83
		10 27 35	64	49·5	0·31	82·6	..	82·5	30·098	...	D = 80
11	Sept. 30	10 31 54	61	57·5	1·15	82·6	..	82·5	30·098	19·90	A = 83
		13 15 36	66	51·0	0·32	83·2	..	83·0	30·021	...	D = 81
12	Sept. 30	1 19 56	63	59·5	1·09	83·2	..	83·0	30·021	19·90	A = 84
		3 27 3	28	15·5	0·40	83·4	..	83·2	30·006	...	D = 82
13	Oct. 1	6 11 23	32	27·5	1·02	82·2	..	82·0	30·062	19·90	A = 82
		8 27 43	70	56·5	0·33	82·2	..	82·0	30·106	...	D = 81
				Copper Pendulum (Knife edge A).						—	
1	Sept. 18	5 15 7	16	11·5	1·08	82·8	..	82·5	30·061	20·69	A = 82
		8 0 3	32	17·5	0·32	82·6	..	82·4	30·096	...	D = 80
2	Sept. 18	8 10 16	25	20·5	1·13	82·7	..	82·5	30·096	20·69	A = 83
		10 46 19	46	32·5	0·35	82·9	..	82·8	30·090	...	D = 80

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APPENDIX. TABLE V.—Para.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
3	Sept. 18	11 1 36	44	40·0	1·10	83·0	..	82·9	30·090	20·69	A =83
		13 37 41	69	55·0	0·35	83·2	..	83·1	30·000	...	D =81
4	Sept. 18	1 48 16	23	19·5	1·13	83·5	..	83·2	30·000	20·69	A =83
		4 24 15	44	29·5	0·34	83·3	..	83·0	29·992	...	D =81
5	Sept. 19	5 17 58	67	62·5	1·09	82·4	..	82·0	30·051	20·98	A =82
		7 53 55	80	67·5	0·34	82·2	..	82·1	30·071	...	D =80
6	Sept. 19	8 4 14	22	18·0	1·08	82·3	..	82·2	30·071	20·98	A =82
		10 49 45	72	58·5	0·31	82·8	..	82·6	30·068	...	D =80
7	Sept. 19	11 3 32	37	34·5	1·10	83·0	..	82·8	30·062	20·98	A =84
		13 39 33	62	47·5	0·35	83·5	..	83·2	30·005	...	D =81
8	Sept. 19	1 51 48	54	51·0	1·13	83·6	..	83·2	30·005	20·98	A =83
		4 18 27	54	40·5	0·35	83·7	..	83·5	29·990	...	D =81
9	Sept. 20	5 12 14	23	18·5	1·12	82·6	..	82·3	30·050	20·76	A =82
		7 48 9	36	22·5	0·35	82·6	..	82·4	30·069	...	D =80
10	Sept. 20	8 1 35	42	38·5	1·13	82·6	..	82·5	30·068	20·76	A =82
		10 47 0	26	13·0	0·32	83·0	..	82·8	30·048	...	D =80
11	Sept. 20	10 55 8	14	11·0	1·16	83·0	..	82·8	30·048	20·76	A =83
		13 31 9	34	21·5	0·34	83·4	..	83·4	29·973	...	D =80
12	Sept. 20	1 35 7	13	10·0	1·15	83·4	..	83·4	29·963	20·76	A =83
		4 10 55	80	67·5	0·34	83·8	..	83·7	29·948	...	D =81
13	Sept. 21	5 9 47	54	50·5	1·16	83·0	..	82·8	30·014	20·90	A =82
		7 45 49	74	61·5	0·34	83·0	..	82·7	30·050	...	D =80
14	Sept. 21	7 59 18	25	23·5	1·16	83·0	..	82·8	30·050	20·90	A =83
		10 35 32	56	44·0	0·34	83·2	..	83·2	30·050	...	D =81
				(Knife	edge	B.)					
1	Sept. 21	10 54 38	45	41·5	1·12	83·5	..	83·5	30·049	20·90	A =83
		*13 47 47	74	60·5	0·33	84·0	..	83·8	29·972	...	D =82
2	Sept. 21	1 51 58	65	61·5	1·07	84·0	..	83·9	29·972	20·90	A =84
		4 17 31	56	43·5	0·39	84·2	..	84·0	29·963	...	D =82
3	Sept. 22	5 13 20	31	25·5	1·07	83·1	..	82·8	30·011	20·87	A =82
		7 57 31	64	47·5	0·34	83·0	..	82·9	30·060	...	D =80

* In the original manuscript book, the time of the last coincidence is stated to be $13^h\ 48^m\ 47^s$: but, on comparing it with that of the preceding ones, it is evidently too great by one minute.—B.

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Appendix. Table V.—Para.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
4	Sept. 22	8 3 26	33	29·5	1·13	83·0	..	82·9	30·060	20·87	A =83
		10 38 40	64	52·0	0·39	83·3	..	83·2	30·050	...	D =81
5	Sept. 22	10 51 50	57	53·5	1·16	83·4	..	83·3	30·050	20·87	A =83
		13 26 53	76	64·5	0·39	84·0	..	83·8	29·972	...	D =82
6	Sept. 22	1 36 0	9	4·5	1·00	84·0	..	83·9	29·972	20·87	A =84
		4 1 51	78	64·5	0·36	84·5	..	84·0	29·952	...	D =82
7	Sept. 23	5 13 14	21	17·5	1·12	83·2	..	82·9	30·011	21·20	A =83
		7 48 29	56	42·5	0·37	83·1	..	83·0	30·061	...	D =81
8	Sept. 23	7 58 50	56	53·0	1·15	83·1	..	82·9	30·063	21·20	A =83
		10 34 19	43	31·0	0·38	83·6	..	83·5	30·055	...	D =81
9	Sept. 23	10 45 49	55	52·0	1·18	83·6	..	83·5	30·055	21·20	A =84
		13 21 7	27	17·0	0·40	84·0	..	83·8	30·013	...	D =81
10	Sept. 23	1 25 1	8	4·5	1·10	84·0	..	83·8	30·013	21·20	A =84
		3 50 55	80	67·5	0·40	84·2	..	84·0	30·000	...	D =82
11	Sept. 24	5 12 45	54	49·5	1·10	83·1	..	82·8	30·049	20·78	A =82
		7 47 54	78	66·0	0·37	83·0	..	82·9	30·095	...	D =80
12	Sept. 24	7 55 11	18	14·5	1·11	83·0	..	82·9	30·095	20·78	A =83
		10 30 31	54	42·5	0·36	83·2	..	83·1	30·068	...	D =81
13	Sept. 24	10 46 23	29	26·0	1·13	83·4	..	83·2	30·088	20·78	A =84
		13 21 31	53	42·0	0·38	83·9	..	83·8	30·044	...	D =82
14	Sept. 24	1 32 24	30	27·0	1·13	83·9	..	83·8	30·042	20·78	A =84
		3 58 9	34	21·5	0·40	84·1	..	83·9	30·021	...	D =81

Trinidad.

Pendulum No. 10. —

1	Nov. 11	6 15 53	54	53·5	0·89	82·2	82·3	82·4	30·111	106·20	A =82
		8 49 29	36	32·5	0·37	82·7	82·7	82·9	30·164	...	D =80
2	Nov. 11	9 11 48	49	48·5	0·92	83·0	83·0	83·2	30·162	106·20	A =83
		11 52 3	11	7·0	0·36	83·6	83·6	83·7	30·145	...	D =81
3	Nov. 11	0 11 44	45	44·5	0·90	83·8	83·7	83·9	30·143	106·20	A =84
		2 38 36	41	38·5	0·39	84·2	84·2	84·4	30·091	...	D =81
4	Nov. 11	2 45 26	27	26·5	0·89	84·2	84·2	84·4	30·091	106·20	A =85
		5 12 16	25	20·5	0·37	83·9	83·9	84·0	30·085	...	D =82

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APPENDIX. TABLE V.—Trinidad.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
5	Nov. 12	6 4 13	15	14·0	0·87	82·3	82·2	82·4	30·092	106·43	A =82
		8 31 12	19	15·5	0·37	82·6	82·6	82·9	30·116	...	D =79
6	Nov. 12	8 38 55	56	55·5	0·87	82·6	82·6	82·9	30·116	106·43	A =82
		11 5 52	59	55·5	0·37	83·7	83·7	83·9	30·113	...	D =81
7	Nov. 12	11 50 8	10	9·0	0·87	84·3	84·3	84·4	30·100	106·43	A =84
		2 23 40	46	43·0	0·35	84·7	84·7	84·7	30·053	...	D =82
8	Nov. 12	2 27 19	20	19·5	0·90	84·7	84·7	84·7	30·055	106·43	A =85
		5 0 47	55	51·0	0·36	84·5	84·5	84·6	30·050	...	D =82
9	Nov. 13	6 7 49	49	49·0	0·93	82·7	82·7	83·0	30·061	106·42	A =83
		8 41 28	35	31·5	0·38	83·3	83·3	83·6	30·096	...	D =81
10	Nov. 13	8 50 19	19	19·0	0·92	83·4	83·4	83·6	30·096	106·42	A =83
		11 17 16	21	18·5	0·38	84·4	84·4	84·4	30·088	...	D =82
11	Nov. 13	11 43 42	45	43·5	0·83	84·5	84·5	84·5	30·075	106·42	A =84
		14 10 37	44	40·5	0·35	84·6	84·5	84·6	30·035	...	D =83
12	Nov. 13	2 18 39	41	40·0	0·90	84·5	84·5	84·7	30·031	106·42	A =85
		4 52 13	21	17·0	0·37	84·4	84·4	84·5	30·005	...	D =83
13	Nov. 14	6 6 19	21	20·0	0·89	82·5	82·5	82·7	30·037	106·02	A =83
		8 26 40	45	42·5	0·39	82·8	82·8	83·1	30·088	...	D =81
14	Nov. 14	8 32 17	18	17·5	0·91	82·8	82·8	83·1	30·092	106·02	A =83
		11 12 40	45	42·5	0·35	83·9	83·9	84·0	30·089	...	D =81
15	Nov. 14	11 38 46	47	46·5	0·90	84·2	84·2	84·3	30·085	106·02	A =84
		2 19 2	9	5·5	0·35	84·5	84·5	84·6	30·033	...	D =83
16	Nov. 14	2 22 29	31	30·0	0·85	84·5	84·5	84·6	30·033	106·02	A =84
		4 49 24	33	28·5	0·35	84·4	84·1	84·4	30·032	...	D =82
17	Nov. 15	5 57 14	15	14·5	0·94	82·5	82·6	82·6	30·028	106·05	A =82
		8 24 6	11	8·5	0·40	82·8	82·8	83·2	30·076	...	D =81
18	Nov. 15	8 31 30	31	30·5	0·90	82·9	82·9	83·2	30·080	106·05	A =83
		10 58 22	27	24·5	0·37	83·9	83·9	84·2	30·081	...	D =82
19	Nov. 15	11 38 44	45	44·5	0·87	84·4	84·4	84·5	30·075	106·05	A =84
		14 12 14	23	18·5	0·35	84·1	84·0	84·2	30·052	...	D =82
20	Nov. 15	2 23 19	20	19·5	0·93	84·1	84·0	84·3	30·052	106·05	A =84
		4 50 17	25	21·0	0·39	83·6	83·5	83·7	30·033	...	D =82

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Appendix. Table V.—Trinidad.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
					Pendulum No. 11.						
		h m s	s	s	°	°	°	°		s	°
1	Nov. 16	8 47 43	44	43·5	0·91	82·6	82·6	82·8	30·092	105·88	A =83
		11 8 11	18	14·5	0·39	83·6	83·7	83·7	30·072	...	D =80
2	Nov. 16	11 40 39	42	40·5	0·89	83·9	83·9	84·0	30·061	105·88	A =84
		14 27 49	58	53·5	0·32	84·5	84·5	84·5	30·029	...	D =82
3	Nov. 16	2 31 45	48	46·5	0·89	84·5	84·5	84·5	30·029	105·88	A =84
		4 43 53	64	58·5	0·39	84·3	84·3	84·3	30·015	...	D =82
4	Nov. 17	5 55 33	34	33·5	0·91	82·4	82·4	82·5	30·025	105·81	A =82
		8 33 53	61	57·0	0·36	82·9	82·9	83·1	30·069	...	D =81
5	Nov. 17	8 38 0	2	1·0	0·89	82·9	82·9	83·1	30·069	105·81	A =84
		11 7 27	36	31·5	0·36	83·7	83·7	83·8	30·067	...	D =82
6	Nov. 17	11 38 21	22	21·5	0·90	84·0	84·0	84·3	30·059	105·81	A =84
		14 16 29	38	33·5	0·34	84·5	84·5	84·6	30·000	...	D =83
7	Nov. 18	5 51 23	26	24·5	0·90	82·4	82·4	82·6	30·030	105·66	A =82
		8 29 47	56	51·5	0·36	82·4	82·3	82·5	30·081	...	D =81
8	Nov. 18	8 37 53	56	54·5	0·90	82·4	82·4	82·5	30·081	105·66	A =82
		11 7 27	36	31·5	0·36	83·0	83·0	83·2	30·090	...	D =81
9	Nov. 18	11 43 43	46	44·5	0·87	83·3	83·3	83·4	30·073	105·66	A =83
		14 30 45	56	50·5	0·31	83·6	83·6	83·7	30·013	...	D =82
10	Nov. 18	2 36 13	14	13·5	0·92	83·5	83·5	83·7	30·013	105·66	A =84
		4 56 51	64	57·5	0·39	83·6	83·5	83·7	30·011	...	D =82
11	Nov. 19	5 50 45	46	45·5	0·90	81·8	81·8	82·0	30·017	105·54	A =82
		8 20 29	38	33·5	0·37	82·4	82·4	82·5	30·069	...	D =80
12	Nov. 19	8 30 15	16	15·5	0·90	82·4	82·4	82·5	30·076	105·54	A =83
		11 8 47	56	51·5	0·34	83·4	83·4	83·5	30·063	...	D =81
13	Nov. 19	11 45 13	14	13·5	0·92	83·5	83·5	83·6	30·050	105·54	A =84
		14 23 31	42	36·5	0·35	83·5	83·5	83·6	30·000	...	D =82
14	Nov. 19	2 38 47	48	47·5	0·92	83·6	83·6	83·7	30·000	105·54	A =84
		4 59 29	47	38·0	0·40	83·4	83·3	83·4	30·001	...	D =82
15	Nov. 20	5 59 45	48	46·5	0·92	81·9	81·9	82·0	30·016	105·90	A =82
		8 38 21	30	25·5	0·36	82·4	82·4	82·6	30·059	...	D =80
16	Nov. 20	8 45 45	46	45·5	0·88	82·4	82·4	82·6	30·059	105·90	A =82
		11 15 35	44	39·5	0·35	83·0	83·0	83·2	30·061	...	D =81

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APPENDIX. TABLE V.—Trinidad.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
17	Nov. 20	11 28 11	14	12·5	0·84	83·0	83·0	83·2	30·053	105·90	A =83
		13 57 57	68	62·5	0·34	83·4	83·4	83·4	30·011	...	D =81
				Iron Pendulum		(Knife	edge	A).		+	
1	Nov. 17	6 17 54	63	58·5	1·06	83·7	..	83·2	30·025	4·37	A =82
		8 59 41	70	55·5	0·29	83·9	..	83·7	30·069	...	D =81
2	Nov. 17	9 2 52	60	56·0	1·12	83·9	..	83·7	30·069	4·37	A =84
		11 27 43	66	54·5	0·34	84·8	..	84·5	30·067	...	D =82
3	Nov. 17	0 0 12	19	15·5	1·21	84·8	..	84·7	30·059	4·37	A =84
		2 24 55	78	66·5	0·36	85·2	..	85·0	30·000	...	D =82
4	Nov. 18	6 16 30	37	33·5	1·15	83·8	..	83·6	30·030	4·22	A =82
		8 49 53	79	66·0	0·34	83·6	..	83·1	30·081	...	D =81
5	Nov. 18	8 53 24	31	27·5	1·15	83·5	..	83·1	30·081	4·22	A =82
		11 18 25	48	36·5	0·34	83·8	..	83·7	30·090	...	D =81
6	Nov. 18	0 0 8	11	9·5	1·22	84·0	..	83·8	30·073	4·22	A =83
		2 59 9	36	22·5	0·29	84·6	..	84·3	30·013	...	D =82
7	Nov. 18	3 3 0	5	2·5	1·20	84·6	..	84·2	30·013	4·22	A =83
		5 10 47	74	60·5	0·40	84·8	..	84·3	30·011	...	D =82
8	Nov. 19	6 9 48	55	51·5	1·15	83·0	..	82·6	30·017	4·03	A =82
		8 43 17	44	30·5	0·32	83·2	..	83·0	30·069	...	D =80
9	Nov. 19	8 48 38	43	40·5	1·22	83·2	..	83·0	30·076	4·03	A =82
		11 30 49	71	60·0	0·32	84·0	..	83·8	30·063	...	D =81
				(Knife	edge	B).					
1	Nov. 19	0 3 39	46	42·5	1·12	84·1	..	83·9	30·050	4·03	A =83
		2 54 37	64	50·5	0·30	84·9	..	84·3	30·000	...	D =82
2	Nov. 19	2 58 0	9	4·5	1·05	84·9	..	84·3	30·000	4·03	A =84
		5 31 51	90	70·5	0·30	84·8	..	84·0	30·001	...	D =82
3	Nov. 20	6 19 36	42	39·0	1·19	83·0	..	82·7	30·016	3·57	A =82
		8 53 43	66	54·5	0·36	83·2	..	83·0	30·059	...	D =80
4	Nov. 20	9 4 52	55	53·5	1·33	83·2	..	83·0	30·059	3·57	A =82
		11 39 7	28	17·5	0·38	83·9	..	83·8	30·061	...	D =81
5	Nov. 20	11 48 34	39	36·5	1·24	83·9	..	83·8	30·053	3·57	A =83
		14 22 55	77	66·0	0·35	84·2	..	84·0	30·011	...	D =81

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Appendix. Table V.—Trinidad.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	°
6	Nov. 21	6 24 35	43	39·0	1·21	82·8	..	82·2	30·002	3·57	A =82
		8 50 20	40	30·0	0·38	82·6	..	82·4	30·063	...	D =81
7	Nov. 21	8 55 17	25	21·0	1·18	82·5	..	82·2	30·063	3·57	A =82
		11 29 47	70	58·5	0·35	82·7	..	82·4	30·059	...	D =81
8	Nov. 21	11 36 17	23	20·0	1·22	82·7	..	82·4	30·059	3·57	A =82
		14 19 17	39	28·0	0·34	82·8	..	82·6	29·979	...	D =80
9	Nov. 21	2 22 30	38	34·0	1·14	82·8	..	82·6	29·979	3·57	A =83
		4 48 21	48	34·5	0·36	83·0	..	82·8	29·973	...	D =81
			Copper Pendulum (Knife edge A).								
1	Nov. 11	6 25 40	46	43·0	1·09	83·2	..	82·6	30·111	6·18	A =82
		9 9 7	32	19·5	0·30	83·6	..	83·2	30·164	...	D =80
2	Nov. 11	9 33 41	45	43·0	1·10	83·6	..	83·3	30·143	6·18	A =83
		12 8 43	66	54·5	0·33	84·3	..	83·9	30·091	...	D =81
3	Nov. 11	0 21 56	61	58·5	1·19	84·4	..	84·0	30·143	6·18	A =84
		2 56 51	72	61·5	0·35	85·0	..	84·6	30·091	...	D =81
4	Nov. 11	3 1 58	63	60·5	1·16	85·0	..	84·6	30·091	6·18	A =85
		5 28 13	40	26·5	0·34	85·0	..	84·8	30·085	...	D =82
5	Nov. 12	6 7 56	62	59·0	1·11	83·4	..	82·9	30·092	5·48	A =82
		8 42 59	82	70·5	0·32	83·6	..	83·2	30·116	...	D =79
6	Nov. 12	8 50 6	11	8·5	1·10	83·6	..	83·3	30·116	5·48	A =82
		11 25 15	35	25·0	0·33	84·5	..	84·2	30·113	...	D =81
7	Nov. 12	0 4 18	23	20·5	1·13	84·7	..	84·5	30·100	5·48	A =84
		2 39 17	37	27·0	0·33	85·5	..	85·2	30·053	...	D =82
8	Nov. 12	2 42 34	39	36·5	1·18	85·5	..	85·2	30·055	5·48	A =85
		5 8 57	76	66·5	0·37	85·7	..	85·2	30·050	...	D =82
9	Nov. 13	6 21 4	9	6·5	1·15	84·0	..	83·7	30·061	5·25	A =82
		8 56 19	40	29·5	0·34	84·2	..	84·0	30·096	...	D =81
10	Nov. 13	9 3 46	51	48·5	1·14	84·2	..	84·0	30·096	5·25	A =84
		11 47 43	64	53·5	0·31	85·0	..	85·0	30·088	...	D =82
11	Nov. 13	11 57 8	15	11·5	1·10	85·1	..	85·0	30·075	5·25	A =84
		14 32 23	42	32·5	0·33	85·5	..	85·2	30·035	...	D =83
12	Nov. 13	2 36 12	17	14·5	1·13	85·5	..	85·2	30·031	5·25	A =85
		5 11 25	48	36·5	0·34	85·5	..	85·0	30·005	...	D =83

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APPENDIX. TABLE V.—Trinidad.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
				(Knife	edge	B.)					
		h m s	s	s	°	°	°	°		s	°
1	Nov. 14	6 23 48	55	51·5	1·03	83·8	..	83·2	30·037	5·43	A =83
		8 49 37	56	46·5	0·36	83·9	..	83·8	30·088	...	D =81
2	Nov. 14	8 54 41	47	44·0	1·23	83·8	..	83·7	30·092	5·43	A =83
		11 29 1	17	9·0	0·39	84·8	..	84·7	30·089	...	D =81
3	Nov. 14	11 54 52	57	54·5	1·11	84·9	..	84·8	30·085	5·43	A =84
		14 37 41	64	52·5	0·35	85·5	..	85·2	30·033	...	D =83
4	Nov. 14	2 42 24	30	27·0	1·11	85·5	..	85·2	30·033	5·43	A =84
		5 8 7	30	18·5	0·37	85·5	..	85·0	30·032	...	D =82
5	Nov. 15	6 14 42	47	44·5	1·19	83·9	..	83·4	30·028	5·16	A =82
		8 49 5	24	14·5	0·37	84·0	..	83·8	30·076	..	D =81
6	Nov. 15	8 52 52	55	53·5	1·20	84·0	..	83·8	30·080	5·16	A =
		11 18 40	57	48·5	0·40	84·8	..	84·6	30·081	...	D =
7	Nov. 15	11 55 52	57	54·5	1·15	85·0	..	84·8	30·075	5·16	A =84
		14 30 13	36	24·5	0·37	85·1	..	84·8	30·052	...	D =82
8	Nov. 15	2 34 38	43	40·5	1·19	85·1	..	84·9	30·052	5·16	A =84
		5 8 57	82	69·5	0·38	85·0	..	84·5	30·033	...	D =82
9	Nov. 16	6 24 16	23	19·5	1·14	83·5	..	83·0	30·046	4·76	A =83
		8 58 45	64	54·5	0·39	83·7	..	83·2	30·078	...	D =81
10	Nov. 16	9 6 46	51	48·5	1·17	83·6	..	83·4	30·092	4·76	A =83
		11 15 29	46	37·5	0·44	84·5	..	84·0	30·072	...	D =80
11	Nov. 16	11 59 14	21	17·5	1·04	84·7	..	84·5	30·061	4·76	A =84
		14 42 15	39	27·0	0·33	85·5	..	85·1	30·029	...	D =82
12	Nov. 16	2 52 16	23	19·5	1·05	85·5	..	85·1	30·029	4·76	A =84
		5 0 56	76	66·0	0·41	85·2	..	85·0	30·015	...	D =82

Porto Bello.

Pendulum No. 10. —

1	Dec. 29	7 18 43	46	44·5	0·88	77·3	77·2	77·4	30·068	102·19	A =77
		9 33 22	27	24·5	0·39	77·4	77·4	77·5	30·085	...	D =76
2	Dec. 29	9 37 54	55	54·5	0·88	77·4	77·3	77·5	30·085	102·19	A =78
		11 39 1	6	3·5	0·41	77·5	77·5	77·6	30·081	...	D =76

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Appendix. Table V.—Porto Bello.

No.	1830.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
3	Dec. 29	0 8 16	18	17·0	0·88	77·8	77·7	77·8	30·079	102·19	A =77
		2 22 51	57	54·0	0·39	77·4	77·3	77·5	30·012	...	D =75
4	Dec. 29	2 25 33	34	33·5	0·84	77·8	77·7	77·8	30·012	102·19	A =78
		4 40 8	14	11·0	0·37	77·6	77·5	77·6	30·001	...	D =76
5	Dec. 30	6 40 5	6	5·5	0·82	76·7	76·6	76·7	30·010	102·21	A =76
		8 48 0	7	3·5	0·39	76·9	76·8	76·9	30·049	...	D =74
6	Dec. 30	9 19 31	33	32·0	0·85	76·9	76·8	77·0	30·050	102·21	A =77
		11 34 11	17	14·0	0·38	77·2	77·1	77·3	30·050	...	D =75
7	Dec. 30	0 1 11	12	11·5	0·88	77·5	77·4	77·5	30·040	102·21	A =78
		2 22 33	39	36·0	0·38	77·1	77·0	77·2	29·999	...	D =75
8	Dec. 30	2 25 25	27	26·0	0·89	77·5	77·4	77·5	29·999	102·21	A =78
		4 40 2	8	5·0	0·40	77·3	77·1	77·3	29·989	...	D =75
9	Dec. 31	6 51 43	45	44·0	0·84	76·4	76·3	76·4	30·038	102·14	A =76
		8 59 41	47	44·0	0·39	76·6	76·5	76·6	30·071	...	D =74
10	Dec. 31	9 2 43	44	43·5	0·82	76·7	76·6	76·7	30·071	102·14	A =77
		11 10 41	47	44·0	0·38	76·8	76·8	77·0	30·071	...	D =75
11	Dec. 31	0 0 21	21	21·0	0·87	77·4	77·3	77·5	30·053	102·14	A =78
		2 21 43	50	46·5	0·37	77·1	77·0	77·2	30·009	...	D =75
12	Dec. 31	2 25 2	4	3·0	0·84	77·5	77·4	77·6	30·009	102·14	A =78
		4 39 41	49	45·0	0·37	77·4	77·3	77·4	30·009	...	D =75
	1831.										
13	Jan. 1	7 1 47	48	47·5	0·88	76·6	76·4	76·6	30·101	102·12	A =77
		9 16 27	33	30·0	0·39	76·8	76·8	76·9	30·133	...	D =75
14	Jan. 1	9 20 10	11	10·5	0·87	76·9	76·8	77·0	30·133	102·12	A =77
		11 28 8	14	11·0	0·40	77·2	77·1	77·3	30·129	...	D =75
15	Jan. 1	11 57 41	42	41·5	0·89	77·5	77·4	77·6	30·125	102·12	A =78
		2 19 5	10	7·5	0·39	77·2	77·0	77·3	30·091	...	D =76
16	Jan. 1	2 22 7	9	8·0	0·89	77·6	77·5	77·6	30·091	102·12	A =78
		4 36 44	50	47·0	0·39	77·3	77·2	77·4	30·079	...	D =76
17	Jan. 2	6 57 11	13	12·0	0·89	77·3	77·2	77·4	30·082	102·05	A =77
		9 11 47	52	49·5	0·39	77·3	77·3	77·4	30·107	...	D =75
18	Jan. 2	9 14 43	44	43·5	0·91	77·3	77·3	77·4	30·107	102·05	A =77
		11 56 15	20	17·5	0·35	77·5	77·4	77·6	30·100	...	D =76
19	Jan. 2	0 5 7	8	7·5	0·85	77·5	77·4	77·6	30·100	102·05	A =78
		2 19 43	48	45·5	0·38	77·7	77·7	77·9	30·045	...	D =77

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APPENDIX. TABLE V.—Porto Bello.

No.	1831.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
20	Jan. 2	2 23 31	32	31·5	0·90	77·9	77·7	78·1	30·045	102·05	A =78
		4 31 19	24	21·5	0·41	77·7	77·8	77·8	30·018	...	D =77
21	Jan. 3	6 10 49	52	50·5	0·84	77·5	77·4	77·6	29·979	101·99	A =77
		8 25 25	30	27·5	0·38	77·8	77·7	77·9	30·000	...	D =75
				Pendulum No. 11.							
1	Jan. 3	10 1 49	51	50·0	0·86	78·6	78·5	78·7	30·001	101·99	A =78
		12 14 54	63	58·5	0·39	78·4	78·3	78·5	29·991	...	D =76
2	Jan. 3	0 18 29	31	30·0	0·88	78·7	78·5	78·7	29·991	101·99	A =79
		2 40 45	54	49·5	0·37	78·4	78·3	78·4	29·950	...	D =76
3	Jan. 3	2 42 33	35	34·0	0·91	78·4	78·3	78·4	29·950	101·99	A =78
		4 56 7	17	12·0	0·40	78·7	78·6	78·7	29·948	...	D =76
4	Jan. 4	6 59 41	43	42·0	0·88	78·0	78·0	78·2	29·993	102·20	A =79
		9 12 52	61	56·5	0·39	78·3	78·2	78·4	30·021	...	D =76
5	Jan. 4	9 16 48	50	49·0	0·90	78·4	78·3	78·4	30·021	102·20	A =79
		11 30 4	11	7·5	0·39	78·6	78·5	78·7	30·013	...	D =77
6	Jan. 4	11 52 32	34	33·0	0·89	78·7	78·7	78·8	30·002	102·20	A =79
		2 50 23	35	29·0	0·29	78·8	78·7	79·0	29·943	...	D =78
7	Jan. 4	2 54 43	46	44·5	0·89	79·1	79·0	79·2	29·940	102·20	A =79
		4 59 11	20	15·5	0·40	78·8	78·6	79·0	....	...	D =78
8	Jan. 5	6 33 29	32	30·5	0·89	78·3	78·2	78·4	30·009	102·01	A =79
		9 31 21	32	26·5	0·29	78·4	78·3	78·5	30·053	...	D =77
9	Jan. 5	9 36 4	7	5·5	0·88	78·5	78·4	78·6	30·053	102·01	A =79
		11 49 27	36	31·5	0·38	78·9	78·8	79·1	30·037	...	D =77
10	Jan. 5	11 53 19	20	19·5	0·89	79·1	79·0	79·2	30·037	102·01	A =79
		14 15 37	46	41·5	0·38	78·9	78·8	79·0	29·985	...	D =78
11	Jan. 5	2 19 41	43	42·0	0·89	79·4	79·2	79·5	29·985	102·01	A =80
		4 41 59	69	64·0	0·37	79·0	78·9	79·1	29·971	...	D =78
12	Jan. 6	6 46 52	54	53·0	0·89	78·4	78·3	78·4	30·015	102·13	A =79
		9 9 14	23	18·5	0·37	78·4	78·4	78·5	30·065	...	D =76
13	Jan. 6	9 13 43	45	44·0	0·88	78·6	78·5	78·8	30·065	102·13	A =79
		11 27 12	20	16·0	0·38	78·9	78·7	79·1	30·057	...	D =77
14	Jan. 6	11 50 43	45	44·0	0·87	79·4	79·2	79·5	30·050	102·13	A =79
		14 31 4	13	8·5	0·32	78·8	78·7	78·9	29·995	...	D =78

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Appendix. Table V.—Porto Bello.

No.	1831.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate.	Hygrom.
		h m s	s	s	°	°	°	°		s	°
15	Jan. 6	2 35 3	5	4·0	0·91	79·4	79·3	79·4	29·995	102·13	A =80
		4 48 29	38	33·5	0·40	78·8	78·7	79·0	29·993	...	D =77

London (after the voyage).

Pendulum No. 10. +

1	July 25	20 20 $\frac{20}{23}$	$\frac{26}{29}$	24·5	1·06	63·4	63·2	63·4	30·076	0·85
		1 25 $\frac{32}{37}$	$\frac{62}{79}$	57·5	0·14	66·2	66·0	66·1	30·094	
2	July 25	1 30 $\frac{20}{23}$	$\frac{26}{29}$	24·5	1·04	66·2	66·0	66·1	30·094	0·90
		6 20 $\frac{8}{27}$	$\frac{36}{53}$	31·0	0·15	68·3	67·9	68·1	30·134	
3	July 25	6 25 $\frac{44}{47}$	$\frac{50}{53}$	48·5	1·06	68·3	67·9	68·1	30·134	0·95
		11 29 $\frac{44}{65}$	$\frac{88}{113}$	77·5	0·12	67·1	66·7	66·9	30·176	
4	July 25	11 59 $\frac{32}{35}$	$\frac{42}{45}$	38·5	1·07	67·0	66·7	66·9	30·176	0·95
		19 7 $\frac{44}{83}$	$\frac{06}{135}$	89·5	0·05	64·9	64·5	64·9	30·182	
5	July 28	1 16 $\frac{11}{14}$	$\frac{15}{18}$	14·5	1·06	73·4	72·9	73·5	30·158	1·05
		6 10 $\frac{43}{44}$	$\frac{73}{74}$	58·5	0·16	75·0	74·5	74·8	30·122	
6	July 29	19 3 $\frac{13}{14}$	$\frac{10}{22}$	17·0	1·00	71·8	71·5	71·6	30·140	0·96
		22 39 $\frac{10}{17}$	$\frac{32}{39}$	24·5	0·24	72·6	72·5	72·5	30·150	
7	July 29	22 43 $\frac{42}{44}$	$\frac{51}{52}$	47·5	1·04	72·8	72·7	72·9	30·150	1·00
		2 4 $\frac{58}{65}$	$\frac{78}{83}$	71·0	0·28	74·4	74·2	74·3	30·136	
	1832.									−
8	Jan. 28	22 17 $\frac{42}{45}$	$\frac{50}{51}$	47·0	1·02	37·3	..	37·3	30·274	1·19
		0 25 $\frac{20}{21}$	$\frac{28}{29}$	24·5	0·43	37·4	..	37·5	30·252	
9	Jan. 28	0 29 $\frac{30}{31}$	$\frac{34}{37}$	33·0	1·03	37·4	..	37·4	30·252	1·19
		2 29 $\frac{34}{35}$	$\frac{40}{43}$	38·0	0·46	37·7	..	37·8	30·222	
10	Jan. 28	2 34 $\frac{28}{29}$	$\frac{34}{37}$	32·0	1·02	37·7	..	37·9	30·222	1·19
		5 12 $\frac{10}{11}$	$\frac{20}{23}$	16·0	0·32	37·6	..	37·8	30·214	
11	Jan. 28	6 37 $\frac{42}{45}$	$\frac{48}{51}$	46·5	1·00	37·7	..	37·6	30·012	1·19
		9 0 $\frac{18}{19}$	$\frac{28}{31}$	24·0	0·36	37·9	..	37·9	30·004	

Pendulum No. 11.

	1831.									+
1	July 26	20 52 $\frac{31}{32}$	$\frac{37}{40}$	35·0	1·02	65·5	65·5	65·5	30·190	0·95
		0 36 $\frac{57}{60}$	$\frac{83}{86}$	71·5	0·25	67·4	67·5	67·4	30·180	
2	July 26	0 41 $\frac{43}{46}$	$\frac{51}{54}$	48·5	1·03	67·4	67·5	67·4	30·180	0·90
		6 21 $\frac{53}{60}$	$\frac{07}{102}$	78·0	0·13	70·5	70·4	70·4	30·192	

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APPENDIX. TABLE V.—London (after the voyage).

No.	1831.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	
3	July 26	6 25 $\frac{33}{36}$	$\frac{31}{32}$	28·0	1·02	70·5	70·4	70·4	30·192	0·85	
		12 14 $\frac{24}{29}$	$\frac{100}{103}$	64·0	0·10	69·5	69·4	69·5	30·244		
4	July 27	12 19 $\frac{57}{60}$	$\frac{71}{74}$	65·5	1·04	70·0	69·8	69·9	30·244	0·90	
		18 58 $\frac{37}{42}$	$\frac{95}{102}$	69·0	0·08	67·8	67·6	67·8	30·258		
5	July 30	0 26 $\frac{43}{44}$	$\frac{52}{53}$	48·0	1·04	72·3	72·1	72·3	30·194	1·20	
		6 15 $\frac{4}{5}$	$\frac{50}{51}$	27·5	0·12	75·4	75·1	75·1	30·162		
6	July 30	6 35 $\frac{7}{8}$	$\frac{15}{16}$	11·5	1·05	75·5	75·4	75·4	30·162	1·25	
		12 22 $\frac{30}{41}$	$\frac{96}{107}$	68·5	0·10	73·3	73·0	73·1	30·178		
7	July 31	12 30 $\frac{30}{33}$	$\frac{41}{45}$	38·0	1·05	74·0	73·5	73·5	30·178	1·27	
		19 15 $\frac{34}{43}$	$\frac{110}{119}$	76·5	0·05	71·3	71·0	71·2	30·146		
	1832.									−	
8	Jan. 30	20 25 $\frac{32}{37}$	$\frac{41}{49}$	40·5	0·82	40·8	..	40·8	30·336	0·18	
		22 50 $\frac{0}{11}$	$\frac{14}{25}$	13·0	0·30	41·1	..	41·1	30·326		
9	Jan. 30	1 34 $\frac{28}{36}$	$\frac{39}{47}$	37·5	1·00	42·4	..	42·3	30·270	0·18	
		3 48 $\frac{0}{15}$	$\frac{18}{33}$	16·5	0·38	42·9	..	42·7	30·238		
10	Jan. 31	23 17 $\frac{28}{37}$	$\frac{38}{47}$	37·5	0·90	42·9	..	42·8	30·070	0·08	
		2 12 $\frac{30}{43}$	$\frac{46}{59}$	44·5	0·26	42·7	..	42·6	29·888		
11	Feb. 1	2 19 $\frac{26}{27}$	$\frac{34}{37}$	31·0	0·87	41·8	..	41·8	29·354	0·00	
		7 19 $\frac{}{24}$	$\frac{31}{48}$	27·5	0·09	42·0	..	42·0	29·290		
12	Feb. 3	20 33 $\frac{48}{49}$	$\frac{56}{59}$	53·0	0·79	42·5	..	42·3	29·518	0·03	
		21 45 $\frac{52}{57}$	$\frac{62}{69}$	60·0	0·46	42·5	..	42·4	29·570		
	1831.			Iron Pendulum (Knife edge A).						+	
1	July 31	21 58 $\frac{36}{39}$	$\frac{40}{43}$	39·5	1·01	72·3	72·0	72·5	30·130	1·30	
		0 23 $\frac{27}{32}$	$\frac{37}{44}$	35·0	0·28	73·5	73·8	73·5	30·110		
2	Aug. 1	0 23 $\frac{20}{25}$	$\frac{24}{29}$	24·5	1·00	73·5	73·7	73·4	30·050	1·32	
		4 14 $\frac{33}{64}$	$\frac{77}{110}$	71·0	0·13	74·2	74·7	73·9	30·026		
		The following Experiments were made in the Vacuum Tube.									
						Outside.	*Inside.*				
3	Aug. 10	22 6 $\frac{20}{21}$	$\frac{23}{24}$	22·0	0·96	70·5	70·4	..	30·080	0·08	
		1 15 $\frac{46}{64}$	$\frac{65}{98}$	73·2	0·19	71·0	70·6	..	30·108		
4	Aug. 10	1 55 $\frac{48}{49}$	$\frac{50}{53}$	50·0	0·99	71·4	70·4	..	0·910	0·08	
		20 8 $\frac{3}{37}$	$\frac{74}{102}$	56·5	0·08	69·0	68·5	..	1·170		
5	Aug. 11	20 12 $\frac{14}{18}$	$\frac{19}{23}$	18·5	1·00	69·1	68·5	..	1·170	0·10	
		19 35 $\frac{50}{160}$	$\frac{163}{277}$	162·5	0·04	71·0	69·6	..	1·410		

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Appendix. Table V.—London (after the voyage).

No.	1831.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. *Outside.*	Thermometers. *Inside.*	Thermometers. Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	
6	Aug. 12	20 29 $\frac{56}{59}$	$\frac{60}{63}$	59·5	0·92	69·1	69·4	..	30·182	0·09	
		1 7 $\frac{23}{72}$	$\frac{75}{110}$	70·0	0·07	70·5	68·9	..	30·146		
7	Oct. 22	2 41 $\frac{12}{19}$	$\frac{20}{23}$	18·5	0·94	57·0	56·2	..	1·050	0·48	
		23 6 $\frac{10}{68}$	$\frac{103}{152}$	85·5	0·03	57·8	57·0	..	1·750		
8	Oct. 23	23 31 $\frac{2}{6}$	$\frac{7}{11}$	6·5	0·94	58·1	57·1	..	1·040	0·48	
		13 17 $\frac{1}{24}$	$\frac{43}{68}$	34·0	0·15	58·5	57·5	..	1·440		
9	Oct. 24	20 28 $\frac{54}{58}$	$\frac{61}{65}$	59·5	1·01	56·4	56·5	..	30·114	0·40	
		23 56 $\frac{53}{56}$	$\frac{65}{70}$	61·0	0·16	56·5	56·5	..	30·104		
10	Oct. 24	23 59 $\frac{24}{38}$	$\frac{43}{57}$	40·5	1·01	56·5	56·5	..	30·104	0·40	
		3 56 $\frac{47}{62}$	$\frac{131}{143}$	97·0	0·14	57·1	56·9	..	30·080		
				(Knife edge B.)							
						Upper.	Middle.				
1	July 31	0 44 $\frac{4}{7}$	$\frac{8}{11}$	7·5	1·00	73·9	74·3	74·2	30·104	1·30	
		3 39 $\frac{57}{60}$	$\frac{75}{78}$	67·0	0·40	74·6	75·1	74·9	30·084		
2	Aug. 1	19 9 $\frac{4}{7}$	$\frac{10}{13}$	8·5	0·98	72·0	71·9	71·2	30·084	1·32	
		23 48 $\frac{0}{38}$	$\frac{63}{94}$	51·0	0·11	73·0	73·0	72·6	30·050		
		The following Experiments were made in the Vacuum Tube.									
						Outside.	*Inside.*				
3	Aug. 12	3 8 $\frac{30}{32}$	$\frac{33}{35}$	32·5	1·02	71·6	71·1	..	30·132	0·07	
		6 51 $\frac{17}{24}$	$\frac{37}{42}$	30·0	0·15	72·1	71·6	..	30·124		
4	Aug. 12	7 24 $\frac{18}{23}$	$\frac{28}{33}$	25·5	1·03	72·1	71·7	..	0·930	0·09	
		1 17 $\frac{1}{2}$	$\frac{31}{34}$	17·0	0·09	69·2	68·0	..	1·210		
5	Aug. 13	1 20 $\frac{0}{2}$	$\frac{5}{9}$	4·0	0·94	72·0	71·0	..	1·210	0·16	
		20 0 $\frac{14}{23}$	$\frac{30}{39}$	26·5	0·06	68·6	68·1	..	1·360		
6	Aug. 14	21 24 $\frac{8}{9}$	$\frac{10}{11}$	9·5	0·96	69·0	69·0	..	30·052	0·15	
		2 37 $\frac{31}{52}$	$\frac{53}{76}$	53·0	0·08	70·9	70·3	..	30·024		
7	Oct. 24	7 14 $\frac{8}{20}$	$\frac{23}{35}$	21·5	0·83	57·5	56·7	..	1·150	0·40	
		20 30 $\frac{56}{107}$	$\frac{136}{165}$	121·0	0·10	56·2	55·5	..	1·450		
8	Oct. 25	20 36 $\frac{28}{34}$	$\frac{35}{43}$	35·0	1·06	56·2	55·5	..	1·450	0·36	
		11 45 $\frac{10}{41}$	$\frac{74}{109}$	58·5	0·10	57·0	56·1	..	1·760		
9	Oct. 26	20 13 $\frac{2}{6}$	$\frac{13}{19}$	10·0	1·05	56·5	56·4	..	29·564	0·34	
		0 29 $\frac{30}{63}$	$\frac{78}{109}$	70·0	0·10	57·0	56·7	..	29·574		
10	Oct. 26	0 36 $\frac{22}{58}$	$\frac{65}{71}$	61·5	0·91	57·0	56·7	..	29·574	0·34	
		2 37 $\frac{26}{41}$	$\frac{46}{63}$	44·0	0·29	58·0	57·4	..	29·590		

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APPENDIX. TABLE V.—London (after the voyage).

No.	1831.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
		h m s	s	s	°	°	°	°		s	
11	Oct. 26	2 39 $\frac{36}{40}$	$\frac{45}{51}$	43·0	1·03	58·0	57·4	..	29·590	0·34	
		5 25 $\frac{1}{31}$	$\frac{34}{61}$	32·5	0·24	57·5	57·3	..	29·638		
		Copper Pendulum (Knife edge A).								+	
1	Aug. 1	5 0 $\frac{47}{50}$	$\frac{55}{60}$	53·0	0·94	74·2	74·8	73·6	30·034	1·32	
		10 57 $\frac{20}{25}$	$\frac{110}{117}$	68·0	0·07	73·0	73·5	72·5	29·992		
2	Aug. 3	19 59 $\frac{10}{11}$	$\frac{18}{19}$	14·5	0·99	70·4	70·3	69·7	29·918	1·00	
		0 28 $\frac{27}{28}$	$\frac{74}{75}$	51·0	0·11	70·9	71·1	70·7	29·920		
		The following Experiments were made in the Vacuum Tube.									
						Outside.	*Inside.*				
3	Aug. 14	12 2 $\frac{52}{54}$	$\frac{56}{59}$	55·2	0·94	70·2	70·1	..	30·074	0·18	
		19 5 $\frac{30}{42}$	$\frac{175}{182}$	109·5	0·03	67·8	68·0	..	30·114		
4	Aug. 15	19 12 $\frac{38}{29}$	$\frac{33}{34}$	31·0	0·99	67·8	68·0	..	30·114	0·10	
		2 1 $\frac{15}{50}$	$\frac{119}{132}$	84·0	0·03	69·8	69·0	..	30·126		
5	Aug. 15	3 45 $\frac{10}{11}$	$\frac{14}{15}$	12·5	1·00	70·6	69·3	..	0·910	0·06	
		19 47 $\frac{51}{58}$	$\frac{123}{128}$	90·0	0·14	68·0	67·5	..	1·110	−	
6	Aug. 16	19 50 $\frac{56}{57}$	$\frac{65}{66}$	61·0	0·89	68·0	67·5	..	1·110	0·06	
		11 24 $\frac{40}{56}$	$\frac{95}{104}$	76·0	0·11	68·0	67·6	..	1·250		
7	Aug. 17	20 7 $\frac{34}{35}$	$\frac{38}{39}$	36·5	0·98	66·8	66·8	..	30·084	0·06	
		1 26 $\frac{10}{50}$	$\frac{71}{100}$	60·0	0·06	68·5	68·0	..	30·034		
8	Aug. 17	1 32 $\frac{8}{11}$	$\frac{12}{13}$	11·0	0·97	68·5	68·0	..	30·034	0·07	
		6 34 $\frac{15}{36}$	$\frac{143}{166}$	90·0	0·06	69·3	68·9	..	30·014	+	
9	Oct. 28	21 21 $\frac{50}{51}$	$\frac{52}{53}$	51·5	1·01	55·7	55·6	..	30·106	0·30	
		0 43 $\frac{11}{21}$	$\frac{38}{48}$	29·5	0·22	55·6	55·5	..	30·176		
10	Oct. 29	3 35 $\frac{50}{60}$	$\frac{64}{65}$	62·0	0·88	54·8	53·7	..	1·020	0·33	
		20 27 $\frac{9}{33}$	$\frac{66}{108}$	59·0	0·12	52·2	51·6	..	1·420		
11	Oct. 30	20 30 $\frac{40}{41}$	$\frac{44}{45}$	42·5	0·90	52·2	51·6	..	1·420	0·29	
		11 12 $\frac{1}{27}$	$\frac{44}{74}$	36·5	0·14	52·1	51·5	..	1·760		
12	Oct. 31	20 16 $\frac{14}{17}$	$\frac{18}{21}$	17·5	1·02	52·0	51·7	..	30·214	0·30	
		23 54 $\frac{51}{58}$	$\frac{65}{74}$	62·0	0·19	52·5	52·1	..	30·212		
13	Oct. 31	23 59 $\frac{12}{16}$	$\frac{21}{23}$	18·0	1·04	52·5	52·1	..	30·212	0·30	
		3 21 $\frac{53}{60}$	$\frac{75}{86}$	68·5	0·19	53·4	52·8	..	30·194		
14	Oct. 31	3 40 $\frac{2}{7}$	$\frac{12}{13}$	9·0	1·02	53·4	52·8	..	30·194	0·30	
		10 56 28	135	81·5	0·04	53·4	53·0	..	30·182		

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Appendix. *Table V.—London (after the voyage).*

No.	1831.	Disappearance	Reap.	Coincid.	Arc.	Thermometers. Upper.	Middle.	Lower.	Barometer.	Rate. +	Hygrom.
				(Knife	edge	B.)					
		h m s	s	s	°	°	°	°		s	
1	Aug. 2	19 24 $\frac{2}{3}$	$\frac{8}{9}$	5·5	1·03	71·5	71·4	70·5	29·900	1·30	
		23 21 $\frac{7}{10}$	$\frac{30}{40}$	24·0	0·19	71·6	71·7	71·2	29·890		
2	Aug. 2	23 23 $\frac{44}{45}$	$\frac{51}{52}$	48·0	1·01	71·6	71·7	71·2	29·890	1·30	
		3 35 $\frac{10}{20}$	$\frac{57}{58}$	38·5	0·16	72·4	72·6	71·9	29·886		
		The following Experiments were made in the Vacuum Tube.									
						Outside.	*Inside.*				
3	Aug. 18	19 7 $\frac{36}{37}$	$\frac{40}{41}$	38·5	1·02	65·9	66·0	..	29·934	0·00	
		1 8 $\frac{9}{63}$	$\frac{100}{158}$	83·2	0·07	65·8	65·8	..	29·930		
4	Aug. 18	1 14 $\frac{34}{39}$	$\frac{36}{41}$	37·5	1·01	65·8	65·8	..	29·930	0·00	
		6 0 $\frac{7}{43}$	$\frac{54}{92}$	49·5	0·13	67·0	66·5	..	29·964		
5	Aug. 18	6 56 $\frac{0}{3}$	$\frac{12}{15}$	7·5	1·00	66·8	65·6	..	0·910	0·00	
		0 51 $\frac{41}{72}$	$\frac{75}{112}$	75·0	0·13	65·9	65·0	..	1·160	−	
6	Aug. 19	0 57 $\frac{10}{14}$	$\frac{17}{21}$	15·5	1·00	65·9	65·0	..	1·160	0·05	
		19 24 $\frac{53}{102}$	$\frac{103}{162}$	110·0	0·10	63·1	62·7	..	1·340		
7	Aug. 20	20 18 $\frac{30}{35}$	$\frac{34}{41}$	35·0	0·99	63·4	63·7	..	29·642	0·11	
		0 20 $\frac{13}{38}$	$\frac{41}{60}$	38·0	0·16	64·1	63·9	..	29·774		
8	Aug. 20	0 23 $\frac{4}{8}$	$\frac{11}{15}$	9·5	1·02	64·1	63·9	..	29·774	0·11	
		5 39 $\frac{23}{80}$	$\frac{113}{162}$	94·5	0·08	65·2	64·9	..	29·874	+	
9	Nov. 1	20 4 $\frac{48}{59}$	$\frac{56}{65}$	57·0	1·00	53·1	53·0	..	30·058	0·26	
		0 57 $\frac{51}{56}$	$\frac{93}{96}$	74·0	0·11	53·7	53·4	..	29·974		
10	Nov. 1	1 1 $\frac{10}{21}$	$\frac{18}{27}$	19·0	0·95	53·7	53·4	..	29·974	0·26	
		5 7 $\frac{42}{43}$	$\frac{85}{88}$	64·5	0·14	54·1	53·8	..	29·948		
11	Nov. 1	11 46 $\frac{26}{35}$	$\frac{30}{39}$	32·5	1·01	54·5	53·8	..	0·940	0·28	
		23 48 $\frac{24}{29}$	$\frac{38}{45}$	34·0	0·25	54·8	54·0	..	1·170		
12	Nov. 2	23 54 $\frac{38}{45}$	$\frac{42}{49}$	43·5	0·98	54·8	54·0	..	1·170	0·30	
		11 23 $\frac{26}{29}$	$\frac{56}{61}$	43·0	0·24	53·5	52·9	.	1·430		
13	Nov. 3	20 13 $\frac{16}{27}$	$\frac{20}{33}$	24·0	1·02	51·7	51·7	.	29·526	0·37	
		0 36 $\frac{8}{15}$	$\frac{60}{65}$	37·0	0·14	51·5	51·5	..	29·478		
14	Nov. 3	0 41 $\frac{28}{37}$	$\frac{38}{47}$	37·5	1·01	51·5	51·5	..	29·478	0·37	
		3 0 $\frac{42}{47}$	$\frac{52}{59}$	50·0	0·34	51·5	51·4	..	29·478		
15	Nov. 3	7 19 $\frac{26}{27}$	$\frac{28}{31}$	28·0	1·02	50·6	50·5	..	29·556	0·37	
		10 25 25	46	35·5	0·26	49·4	49·5	..	29·626		

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TABLE VI.—Results of the Experiments.

London (before the voyage).

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barom.	Rate.	Vibrations in a Mean Solar Day.
			Pendulum No. 10.					
	h m s		s	+	−	+	+	
1	2 48 28·0	23	439·448	1·187	3·892	10·199	0·418	86014·757
2	3 17 45·5	27	439·463	0·969	3·828	10·188	0·418	14·539
3	2 55 57·5	24	439·896	0·968	4·018	10·166	0·418	14·714
4	2 55 46·5	24	439·438	1·118	3·955	10·148	0·418	14·500
5	2 55 41·0	24	439·208	1·067	3·638	10·085	0·418	14·496
6	3 2 53·5	25	438·940	1·177	3·511	10·103	0·418	14·511
7	3 2 50·0	25	438·800	1·096	3·278	10·123	0·418	14·557
8	2 55 20·0	24	438·333	1·113	2·898	10·107	0·418	14·518
	23 44 42·0	196					Mean =	86014·574
					Add for hei	ght above	the Sea =	0·254
								86014·828
			Pendulum No. 11.					
1	3 18 17·0	20	594·850	1·157	2·813	10·154	0·419	86118·424
2	2 58 27·0	18	594·833	1·096	2·729	10·155	0·419	18·439
3	3 8 23·5	19	594·921	1·164	2·961	10·194	0·419	18·357
4	3 8 28·0	19	595·158	0·980	2·750	10·121	0·419	18·427
5	2 58 20·5	18	594·472	1·231	2·771	10·112	0·419	18·313
6	3 8 40·5	19	595·816	0·996	3·067	10·158	0·419	18·484
7	3 8 34·5	19	595·500	0·742	2·834	10·164	0·419	18·315
	21 49 11·0	132					Mean =	86118·394
					Add for hei	ght above	the Sea =	0·254
								86118·648
			Iron Pendulum (Knife edge A).					
1	2 30 59·5	10	905·950	+ 1·950	− 3·488	+ 13·268	− 1·460	86219·530
2	2 0 17·0	8	902·125	2·156	3·321	13·207	1·460	19·034
3	4 33 4·5	18	910·250	1·170	3·528	13·246	1·460	19·590

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Appendix. *Table VI.—London (before the voyage).*

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	−	+	−	
4	1 30 5·0	6	900·833	2·420	3·767	13·354	1·670	86218·514
5	3 31 41·0	14	907·214	1·420	3·788	13·353	1·670	18·841
6	2 47 21·5	11	912·863	1·724	4·781	13·508	1·700	19·455
7	2 16 55·5	9	912·833	1·938	5·031	13·609	1·500	19·714
8	2 16 50·5	9	912·277	1·947	4·464	13·632	1·500	20·198
	21 27 14·5	85					Mean =	86219·359
					Add for height above the Sea =			0·278
								86219·637
			(Knife edge B).					
1	1 45 19·5	7	902·786	2·422	3·456	14·039	1·460	86220·138
2	3 31 38·5	14	907·036	1·528	3·321	14·023	1·460	20·359
3	2 47 7·0	11	911·545	1·720	4·236	14·206	1·670	20·451
4	2 16 4·5	9	907·167	2·000	3·807	14·180	1·670	20·220*
5	5 51 41·5	23	917·456	0·991	4·104	14·206	1·670	21·075
6	2 32 49·0	10	916·900	1·774	4·997	14·367	1·700	20·978
7	3 17 50·0	13	913·077	1·550	4·752	14·454	1·500	20·502
8	3 48 6·5	15	912·433	1·372	4·493	14·449	1·500	20·443
	25 50 36·5	102					Mean =	86220·521
					Add for height above the Sea =			0·278
								86220·799
			Copper Pendulum (Knife edge A).					
1	1 48 32·5	7	930·357	2·442	2·942	11·514	1·050	86224·328
2	2 35 41·0	10	934·100	1·962	3·081	11·510	1·050	24·350
3	2 52 42·0	11	942·000	1·810	4·384	11·575	1·240	24·321
4	2 36 33·0	10	939·300	1·935	4·272	11·531	1·240	23·988
5	1 33 26·5	5	934·417	2·658	4·436	11·472	1·240	23·625
	11 26 55·0	43					Mean =	86224·122
					Add for height above the Sea =			0·278
								86224·400

* This experiment was made by Capt. Foster.—B.

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APPENDIX. *TABLE VI.—London (before the voyage).*

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
			(Knife edge B).					
	h m s		s	+	−	+	−	
1	1 48 7·5	7	926·786	2·601	2·942	12·107	1·050	86224·266
2	2 35 26·0	10	932·600	2·023	3·244	12·136	1·050	24·577
3	3 24 4·0	13	941·846	1·705	4·742	12·239	1·240	24·494
4	2 36 20·0	10	938·000	2·119	4·193	12·104	1·240	24·568
5	3 8 8·0	12	940·667	1·776	4·331	12·087	1·240	24·492
	13 32 5·5	52					Mean =	86224·479
					Add for height above the Sea =			0·278
								86224·757
			Greenwich.					
			Pendulum No. 10.					
				+	−	+	+	
1	2 32 49·5	21	436·643	0·724	7·474	10·229	6·510	86014·242
2	2 32 23·0	21	435·381	0·714	6·205	10·170	6·510	14·295
3	2 31 50·5	21	433·833	0·742	5·153	10·132	6·510	13·921 *
4	2 31 42·5	21	433·452	0·711	4·746	10·116	6·510	13·930 †
5	2 31 53·5	21	433·976	0·689	4·983	10·179	6·510	14·216 ‡
6	2 31 31·0	21	432·905	0·711	4·285	10·140	6·510	13·912 §
7	2 31 48·5	21	433·738	0·724	4·941	10·209	6·510	14·104 ‖
8	2 17 8·0	19	433·053	0·695	4·315	10·177	6·510	14·040 ¶
9	2 31 50·0	21	433·810	0·724	5·300	10·297	6·510	13·899
10	2 31 45·5	21	433·595	0·682	5·013	10·282	6·510	13·932
	25 4 42·0	208					Mean =	86014·049
					Add for height above the Sea =			0·437
								86014·486

* During this experiment, the pendulum and clock case were slightly coated with moisture.—F.

† Pendulum of experiment covered with a copious precipitation of moisture.—F.

‡ Pendulum slightly covered with moisture.—F.

§ Slight coat of moisture on the pendulum of experiment.—F.

‖ No perceptible moisture on the pendulum of experiment.—F.

¶ This experiment was made by Lieut. Kendall.—F.

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Appendix. Table VI.—Greenwich.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
				Pendulum No. 11.				
	h m s		s	+	−	+	+	
1	2 9 15·0	13	596·538	0·650	10·067	10·230	6·518	86117·660
2	2 17 54·0	14	591·000	0·626	7·424	10·078	6·518	17·412
3	2 18 26·0	14	593·286	0·698	8·883	10·151	6·518	17·224
4	2 17 24·5	14	588·893	0·667	6·747	10·044	6·518	17·050
5	2 17 40·5	14	590·036	0·718	7·310	10·056	6·518	17·118
6	2 16 28·0	14	584·857	0·667	5·089	9·926	6·518	16·564
7	2 17 54·5	14	591·036	0·624	7·792	9·989	6·518	16·971
8	2 27 0·5	15	588·033	0·660	6·442	9·912	6·518	16·787
9	2 17 57·5	14	591·250	0·698	7·644	9·980	6·518	17·289
10	2 17 25·5	14	588·964	0·667	6·493	9·929	6·518	17·224
	22 57 26·0	140					Mean=	86117·130
					Add for height above the Sea =			0·437
								86117·567
				Monte Video.				
				Pendulum No. 10.				
				+	−	+	−	
1	2 28 5·0	21	423·095	0·724	5·194	10·287	47·276	85950·121
2	2 35 31·5	22	424·159	0·754	6·142	10·315	47·276	50·256
3	2 35 26·5	22	423·932	0·751	5·824	10·297	47·276	50·335
4	2 35 17·5	22	423·523	0·714	5·427	10·266	47·276	50·270
5	2 35 25·0	22	423·864	0·738	5·647	10·333	47·276	50·470
6	2 35 24·0	22	423·836	0·692	5·593	10·332	47·276	50·450
7	2 35 16·0	22	423·455	0·698	5·326	10·317	47·276	50·341
8	2 35 4·5	22	422·932	0·720	4·759	10·305	47·604	50·085
9	3 3 15·5	26	422·904	0·642	4·505	10·279	47·604	50·208
10	2 20 54·0	20	422·700	0·738	4·167	10·248	47·604	50·414
11	2 34 47·0	22	422·136	0·624	4·031	10·189	47·285	50·150
12	2 34 46·0	22	422·091	0·654	3·985	10·177	47·285	50·170
13	2 34 46·0	22	422·091	0·707	3·947	10·162	47·285	50·246
14	2 34 44·0	22	422·000	0·698	3·905	10·138	47·713	49·739
15	2 34 43·0	22	421·955	0·676	3·943	10·140	47·713	49·637
16	2 34 40·5	22	421·841	0·717	3·943	10·138	47·713	49·565

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Appendix. Table VI.—Monte Video.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	−	+	−	
17	2 34 54·0	22	422·455	0·689	4·175	10·258	48·131	85949·622
18	2 34 42·5	22	421·932	0·694	4·006	10·262	48·131	49·274
19	2 34 39·5	22	421·795	0·698	3·713	10·249	48·131	49·425
20	2 34 57·0	22	422·591	0·711	4·103	10·320	47·414	49·907
21	2 34 58·0	22	422·636	0·730	3·976	10·308	47·414	50·785
22	2 34 48·0	22	422·182	0·707	3·566	10·278	47·414	50·702
23	2 34 42·5	22	421·932	0·698	3·765	10·262	46·668	50·982
24	2 34 40·5	22	421·841	0·667	3·608	10·233	46·668	50·990
25	2 34 28·0	22	421·273	0·667	3·286	10·196	46·668	50·702
	64 50 56·0	551					Mean=	85950·194
				Correction for error of Barometer =				0·044
				Add for height above the Sea =				0·036
								85950·274
			Pendulum No. 11.					
1	3 25 51·0	22	561·409	0·646	2·919	10·091	47·390	86052·631
2	2 29 36·5	16	561·031	0·816	2·632	10·066	47·390	52·856
3	2 38 55·0	17	560·882	0·676	2·128	10·021	47·390	53·093
4	2 48 13·0	18	560·722	0·647	2·263	9·943	46·882	53·271
5	2 38 48·5	17	560·500	0·663	2·136	9·928	46·882	53·277
6	2 29 22·5	16	560·156	0·730	1·954	9·938	46·882	53·347
7	2 38 49·0	17	560·529	0·717	3·583	10·078	46·324	52·608
8	2 38 47·5	17	560·441	0·694	2·599	10·089	46·324	53·532
9	2 38 43·0	17	560·177	0·663	2·377	10·071	46·324	53·559
10	2 38 53·5	17	560·794	0·701	3·286	10·160	46·364	53·077
11	2 38 51·5	17	560·676	0·720	3·323	10·172	46·364	53·006
12	2 38 57·0	17	561·000	0·663	3·202	10·168	46·364	53·244
13	2 48 42·0	18	562·333	0·743	4·399	10·267	46·364	52·956
14	3 26 20·0	22	562·727	0·578	4·272	10·260	46·364	53·126
15	2 39 15·0	17	562·059	0·746	3·773	10·194	46·364	53·362
	41 38 5·0	265					Mean =	86053·130
				Correction for error of Barometer =				0·044
				Add for height above the Sea =				0·036
								86053·214

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Appendix. Table VI.—Staten Island.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
				Pendulum No. 10.				
	h m s		s	+	−	+	+	
1	2 32 56·0	22	417·091	0·621	3·244	10·100	36·633	86029·812
2	2 32 59·0	22	417·227	0·661	3·692	10·123	36·633	29·562
3	2 34 36·5	22	421·659	0·649	7·076	10·276	36·636	30·675
4	2 33 52·5	22	419·659	0·664	5·258	10·169	36·635	30·446
5	2 39 57·0	23	417·261	0·676	3·435	10·045	36·633	29·790
6	2 32 57·0	22	417·136	0·733	3·713	10·047	36·633	29·447
7	2 34 15·0	22	420·682	0·701	6·451	10·082	35·749	29·319
8	2 33 51·0	22	419·591	0·714	5·614	10·018	35·749	29·037
9	2 40 31·0	23	418·739	0·717	4·865	9·963	35·749	28·896
10	3 8 30·0	27	418·889	0·600	5·021	9·948	35·749	28·756
11	2 34 20·0	22	420·909	0·714	6·802	9·986	36·376	29·734
12	2 34 5·5	22	420·250	0·711	6·197	9·960	36·376	29·666
13	2 33 49·5	22	419·523	0·733	5·617	9·928	36·376	29·523
14	2 33 49·5	22	419·523	0·757	5·647	9·927	36·376	29·516
15	2 34 29·5	22	421·341	0·692	7·182	9·988	36·396	29·774
16	2 48 19·0	24	420·792	0·717	6·472	9·943	36·396	29·930
17	2 47 59·0	24	419·958	0·707	5·867	9·898	36·396	29·664
18	2 33 53·5	22	419·705	0·733	5·761	9·861	36·396	29·511
19	2 34 36·5	22	421·659	0·724	7·551	9·833	36·406	29·602
20	2 34 31·0	22	421·409	0·733	7·276	9·844	36·406	29·654
21	2 34 29·5	22	421·341	0·720	7·242	9·886	36·406	29·650
22	2 34 32·0	22	421·455	0·779	7·495	9·930	36·406	29·611
23	2 42 18·5	23	423·413	0·752	8·684	9·980	36·208	30·143
24	2 34 31·5	22	421·432	0·711	6·777	9·846	36·207	29·956
25	2 34 31·0	22	421·409	0·733	7·030	9·940	36·008	29·598
26	2 34 26·5	22	421·205	0·779	6·823	9·925	36·008	29·637
	68 9 7·0	584				(First Series)	Mean =	86029·650
				Correction for error of Barometer =				0·044
								86029·694

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APPENDIX. TABLE VI.—Staten Island.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
				Second Series.				
	h m s		s	+	−	+	+	
27	2 41 35·0	23	421·522	0·720	7·001	10·027	36·376	86030·178
28	2 34 0·0	22	420·000	0·747	5·571	9·933	36·376	30·056
29	2 33 25·5	22	418·432	0·752	4·264	9·860	36·375	29·752
30	2 40 10·5	23	417·848	0·743	3·841	9·838	36·375	29·567
31	2 41 29·5	23	421·283	0·720	6·674	10·065	36·277	30·212
32	2 33 56·0	22	419·818	0·733	5·427	9·999	36·276	29·973
33	2 40 39·0	23	419·087	0·720	4·768	9·960	36·276	29·863
34	2 33 28·5	22	418·568	0·743	4·526	9·942	36·276	29·599
35	2 34 20·0	22	420·909	0·790	5·998	9·983	36·287	30·515
36	2 33 49·5	22	419·523	0·733	5·182	9·950	36·287	29·891
37	2 33 37·5	22	418·977	0·766	4·894	9·953	36·286	29·678
38	2 33 46·0	22	419·364	0·711	5·321	9·974	36·286	29·597
39	2 41 32·5	23	421·413	0·685	6·823	9·989	36·148	29·949
40	2 34 21·0	22	420·955	0·680	6·218	9·986	36·148	30·101
41	2 55 13·0	25	420·520	0·647	6·082	10·010	36·148	29·803
42	2 35 5·0	22	422·955	0·733	8·270	10·167	36·466	30·541
43	2 34 53·0	22	422·409	0·720	7·720	10·120	36·466	30·503
44	2 34 41·0	22	421·864	0·730	7·297	10·057	36·466	30·345
45	2 35 15·0	22	423·409	0·724	8·849	10·166	36·327	30·251
46	2 35 1·5	22	422·795	0·733	8·079	10·165	36·327	30·437
	52 20 19·0	448				(Second Series)	Mean =	86030·041
	120 29 26	1032	.....	....	....	General	Mean =	86029·842
						Add for height above the Sea =		0·046
								86029·888
				Pendulum	No. 11.			
1	2 31 5·5	16	566·594	0·533	8·395	10·222	36·221	86133·600
2	3 17 34·0	21	564·476	0·538	7·403	10·163	36·221	33·394
3	2 30 5·5	16	562·844	0·752	6·777	10·132	36·221	33·318
4	2 39 45·0	17	563·824	0·676	6·980	10·317	36·092	33·626

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Appendix. Table VI.—Staten Island.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	−	+	+	
5	2 48 12·5	18	560·694	0·681	4·886	10·195	36·091	86133·902 *
6	2 37 50·5	17	557·059	0·726	3·354	10·097	36·090	33·359
7	2 38 16·5	17	558·618	0·685	3·967	10·110	36·090	33·582 †
8	2 39 35·0	17	563·235	0·759	6·358	10·293	36·440	34·335
9	2 38 24·0	17	559·059	0·704	4·230	10·196	36·439	34·019
10	2 38 3·0	17	557·824	0·704	3·587	10·171	36·439	33·952
11	2 38 8·0	17	558·118	0·694	3·913	10·190	36·439	33·798
12	2 39 49·0	17	564·647	0·739	6·707	10·332	36·162	34·494
13	2 38 39·0	17	559·941	0·736	4·772	10·231	36·160	33·751
14	2 37 48·5	17	556·971	0·726	3·478	10·164	36·160	33·323
15	2 38 6·0	17	558·000	0·707	4·124	10·196	36·160	33·262
16	2 39 50·0	17	564·118	0·713	6·904	10·317	36·252	34·059
17	2 39 55·5	17	564·412	0·746	6·332	10·275	36·252	34·781
18	2 40 5·5	17	565·029	0·756	6·007	10·222	36·251	35·397
19	2 40 19·0	17	565·824	0·704	6·134	10·204	36·251	35·630 ‡
20	2 40 11·0	17	565·353	0·713	6·578	10·102	36·251	35·838
21	2 39 36·0	17	563·294	0·685	5·300	10·087	36·252	34·957
22	2 39 32·5	17	563·088	0·736	5·011	10·127	36·252	35·225
23	2 39 38·5	17	563·441	0·713	5·216	10·175	36·252	35·237
24	2 40 38·5	17	566·941	0·704	7·182	10·288	36·251	35·267
25	2 49 43·5	18	565·750	0·719	6·443	10·225	36·251	35·317
26	2 49 28·0	18	564·889	0·710	6·062	10·182	36·252	35·181
	69 50 20·0	247					Mean =	86134·331
					Add for height above the Sea =			0·046
								86134·377
			Iron Pendulum (Knife edge A).					
1	2 27 27·5	16	552·969	1·154	4·441	13·397	136·206	86233·811
2	2 27 30·5	16	553·156	1·200	3·649	13·299	136·206	34·667
3	2 37 3·5	17	554·324	1·077	3·491	13·268	136·206	35·329

* The stand of the pendulum, and the pendulum itself, slightly bedewed with moisture.—F.

† This experiment made under very unfavourable circumstances of light: the sky densely overcast, and a good deal of fog, low down on the sides of the surrounding mountains.—F.

‡ The light very faint at the time of this experiment; there being, at the time, a gale of wind from the N.W., with a great deal of fog and small drizzling rain.—F.

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APPENDIX. TABLE VI.—Staten Island.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	−	+	+	
4	2 36 55·0	17	553·824	1·005	4·306	13·271	136·287	86234·245
5	2 36 52·5	17	553·676	1·077	3·744	13·190	136·287	34·714
6	2 36 59·0	17	554·059	0·927	3·015	13·094	136·287	35·413
7	2 37 20·5	17	555·324	0·922	2·684	13·045	136·287	36·400
8	2 46 24·5	18	554·694	0·947	4·291	13·231	136·486	34·850
9	2 37 18·5	17	555·206	0·856	4·262	13·272	136·486	35·116
10	2 37 26·0	17	555·647	0·971	4·349	13·326	136·486	35·445
11	2 37 20·0	17	555·294	1·077	4·420	13·369	136·486	35·326
	28 38 37·5	186					Mean =	86235·029
				Add for height above the Sea =				0·046
								86235·075
			(Knife edge B).					
1	2 37 13·0	17	554·882	0·716	4·968	14·293	136·087	86235·711
2	2 36 58·5	17	554·029	0·960	3·980	14·193	136·087	35·363
3	2 46 14·5	18	554·139	1·030	3·750	14·188	136·087	35·720
4	2 37 4·5	17	554·382	0·845	3·663	14·189	136·087	35·760
5	2 36 52·0	17	553·647	1·038	4·363	14·197	136·625	35·385
6	2 36 53·5	17	553·735	1·049	4·081	14·178	136·625	35·709
7	2 36 53·0	17	553·706	0·913	3·865	14·167	136·625	35·761
8	2 37 2·5	17	554·265	0·594	3·715	14·149	136·625	35·889
9	2 37 2·5	17	554·265	0·903	5·069	14·316	136·625	35·011
10	2 36 56·0	17	553·882	1·049	4·758	14·301	136·625	35·237
11	2 27 43·5	16	553·969	0·941	4·253	14·254	136·625	35·636
12	2 37 0·0	17	554·118	0·943	4·061	14·238	136·625	35·898
	31 23 53·5	204					Mean =	86235·590
				Add for height above the Sea =				0·046
								86235·636
			Copper Pendulum (Knife edge A).					
1	2 51 45·5	18	572·528	0·979	7·489	11·708	136·870	86240·248 *
2	2 42 2·0	17	571·882	1·088	6·642	11·643	136·870	40·799

* This being the first experiment after the alteration of the rate of the clock from nearly mean solar to sidereal time, I do not rely much upon it, but regard it merely as an experiment for trying the adjustments, &c.—F.

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Appendix. Table VI.—Staten Island.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	−	+	+	
3	3 1 27·5	19	573·026	0·944	6·378	11·603	136·870	86241·482
4	2 42 2·5	17	571·912	1·058	6·268	11·571	136·870	41·086
5	2 41 50·0	17	571·176	1·201	7·273	11·593	137·596	40·583
6	2 41 53·0	17	571·353	1·128	6·675	11·564	137·596	41·173
7	2 41 50·5	17	571·206	1·110	6·256	11·546	137·596	41·478
8	2 41 37·5	17	570·441	0·992	5·963	11·537	137·595	41·237 *
	22 4 28·5	139			(First Series)		Mean =	86241·010
9	2 42 7·0	17	572·176	0·814	7·957	11·847	137·039	86239·738
10	2 42 8·5	17	572·265	0·977	7·578	11·821	137·039	40·301
11	2 22 53·5	15	571·567	1·255	7·041	11·774	137·039	40·700 †
12	2 23 11·0	15	572·733	1·315	6·919	11·761	137·040	41·485 ‡
13	2 41 55·5	17	571·500	1·161	7·599	11·771	137·268	40·239
14	2 42 0·5	17	571·794	0·960	7·151	11·744	137·268	40·614
15	2 42 5·0	17	572·059	0·998	7·041	11·757	137·268	40·915
16	2 42 15·5	17	572·676	1·085	7·374	11·806	137·269	41·044 §
	20 58 36·5	132			(Second Series)		Mean =	86240·629
	43 3 5·0	271	.....	....	....	General	Mean =	86240·818
					Add for height above the Sea =			0·046
								86240·864

* The observation of this arc is very uncertain, the light not being sufficiently strong; and I take this opportunity of expressing my belief that the arc of vibration would be better and more accurately measured by means of the circular divisions, instead of the diagonal divisions for hundredths, &c., which, being so small, require very strong light, or sharper eyes than I possess, to catch the exact division.—F.

† The last observation, in this experiment, was rendered very uncertain from the darkness of the room by reason of the overcast state of the sky; and as it was raining, the light was further diminished by the water that adhered to the windows.—F.

‡ Before this experiment was concluded, the night became so dark that neither the arc, nor the times of disappearance or re-appearance of the disc, could be satisfactorily noted.—F.

§ The temperature of the room, towards the close of this experiment, fell to 42° near the windows; and a visible vapour was deposited on the glass inside the room; but the pendulum and stand were free from moisture.—F.

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APPENDIX. TABLE VI.—Staten Island.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
			(Knife edge B).					
	h m s		s	+	−	+	+	
1	2 40 22·0	17	566·000	1·154	7·733	12·405	136·655	86237·181
2	2 40 24·5	17	566·147	1·154	7·659	12·430	136·655	37·359
3	2 40 27·5	17	566·324	1·028	7·659	12·458	136·655	37·356
4	2 40 25·5	17	566·206	1·135	7·753	12·500	136·655	37·348 *
5	2 40 42·5	17	567·206	1·023	8·181	12·572	136·965	37·728
6	2 40 23·0	17	566·059	1·135	7·436	12·502	136·965	37·898
7	2 49 51·0	18	566·167	0·734	6·614	12·421	136·965	38·296
8	2 40 26·0	17	566·235	0·900	6·818	12·413	136·965	38·286
9	2 40 32·0	17	566·588	1·157	8·006	12·415	136·805	37·387
10	2 40 30·5	17	566·500	1·056	7·530	12·380	136·805	37·680
11	2 40 21·5	17	565·971	0·924	6·899	12·341	136·805	37·855
12	2 40 20·0	17	565·882	1·061	6·593	12·336	136·805	38·245
	32 14 46·0	205				(First Series)	Mean =	86237·718
13	2 40 57·5	17	568·088	1·108	8·690	12·536	136·009	86236·785
14	2 40 51·0	17	567·706	1·125	8·047	12·489	136·009	37·193
15	2 40 31·5	17	566·559	1·114	7·090	12·411	136·009	37·445
16	2 50 1·5	18	566·750	1·044	6·573	12·371	136·009	37·955
	10 52 21·5	69				(Second Series)	Mean =	86237·345
	43 7 7·5	274	.....	....	....	General	Mean =	86237·625
						Add for height above	the Sea =	0·046
								86237·671

South Shetland.

Pendulum No. 10.

				+	−	+	+	
1	2 30 51·0	22	411·409	0·682	10·271	10·344	79·302	86060·036
2	2 30 32·0	22	410·545	0·692	9·653	10·320	79·302	59·757

* The arcs, in this experiment, are computed; the light not being sufficiently strong for observing the divisions of the scale, they being so finely drawn: and I have only again to express my regret at not having a circular arc fitted to this pendulum before I left England.—F.

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Appendix. Table VI.—South Shetland.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	−	+	+	
3	2 30 33·5	22	410·614	0·621	9·462	10·321	79·302	86059·948
4	2 31 6·0	22	412·091	0·645	11·654	10·485	80·000	60·150
5	2 31 5·0	22	412·045	0·612	11·590	10·480	80·000	60·130
6	2 44 51·5	24	412·146	0·606	11·666	10·480	80·000	60·150
7	2 58 35·5	26	412·135	0·561	11·844	10·490	80·000	59·926
8	2 31 23·0	22	412·864	0·673	12·596	10·508	79·732	59·777
9	2 31 18·5	22	412·659	0·633	11·950	10·461	79·732	60·128
10	2 58 26·0	26	411·769	0·606	11·083	10·407	79·732	60·008
11	2 37 40·0	23	411·304	0·592	10·554	10·378	79·731	60·019
12	2 31 16·0	22	412·545	0·642	12·403	10·468	79·522	59·365
13	2 31 4·5	22	412·023	0·624	11·306	10·405	79·522	59·848
14	2 30 33·5	22	410·614	0·633	9·885	10·329	79·522	59·765
15	2 30 19·5	22	409·977	0·624	9·221	10·293	79·520	59·729
16	2 31 6·0	22	412·091	0·705	11·633	10·417	79·313	59·476
17	2 31 2·0	22	411·909	0·673	11·061	10·386	79·313	59·800
18	2 30 56·5	22	411·659	0·661	10·681	10·367	79·313	59·894
19	2 30 56·0	22	411·636	0·603	10·566	10·360	79·313	59·921
20	2 58 34·0	26	412·077	0·549	11·633	10·391	79·312	59·279
21	2 30 53·5	22	411·523	0·664	10·694	10·334	79·312	59·711
22	2 30 37·0	22	410·773	0·612	9·995	10·291	79·311	59·548
23	2 51 2·5	25	410·500	0·553	9·635	10·264	79·311	59·543
	59 54 43·0	524					Mean =	86059·822
					Add for height above		the Sea =	0·063
								86059·885
				Pendulum	No. 11.			
1	2 43 13·5	18	544·083	0·525	7·289	10·194	78·510	86164·341
2	2 43 17·0	18	544·278	0·525	6·628	10·159	78·510	65·081
3	2 44 25·5	18	548·083	0·545	7·254	10·193	78·512	66·716*
4	2 45 0·5	18	550·028	0·595	9·848	10·325	78·514	65·388
5	2 45 48·0	18	552·667	0·553	9·771	10·318	78·514	66·949
6	2 46 20·0	18	554·444	0·574	9·720	10·309	78·516	68·016

* The evening became very dark towards the end of this experiment.—F.

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APPENDIX. TABLE VI.—South Shetland.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	−	+	+	
7	2 45 27·0	18	551·500	0·562	9·720	10·302	78·515	86166·332
8	2 45 29·0	18	551·611	0·574	10·279	10·325	78·514	65·870
9	2 45 34·5	18	551·917	0·642	10·292	10·295	78·514	66·069
10	2 46 19·0	18	554·389	0·545	9·877	10·267	78·516	67·757
11	3 5 26·5	20	556·325	0·565	9·877	10·264	78·517	68·859
12	2 47 16·0	18	557·556	0·550	10·089	10·266	78·517	69·320
13	2 46 2·5	18	553·472	0·638	11·302	10·286	78·525	65·936
14	2 46 15·5	18	554·194	0·604	11·210	10·275	78·525	66·390
15	2 46 19·5	18	554·417	0·625	11·083	10·262	78·525	66·650
16	2 46 25·5	18	554·750	0·604	11·040	10·256	78·525	66·854
17	2 46 35·0	18	555·278	0·600	11·210	10·260	78·525	66·980
18	2 56 8·5	19	556·237	0·476	11·675	10·252	78·537	66·931
19	2 46 56·5	18	556·472	0·591	11·506	10·235	78·537	67·329
20	2 47 23·5	18	557·972	0·579	11·412	10·224	78·537	68·235
21	2 47 15·0	18	557·500	0·501	11·285	10·215	78·537	68·013
22	2 56 46·5	19	558·237	0·541	11·294	10·214	78·537	68·452
23	2 48 18·0	18	561·000	0·550	11·590	10·245	78·569	69·753
24	2 39 53·0	17	564·294	0·579	11·231	10·225	78·570	71·919
25	2 50 29·0	18	568·278	0·447	10·575	10·196	78·572	74·563
26	2 50 54·0	18	569·667	0·565	9·983	10·172	78·573	75·992
27	2 32 38·5	16	572·406	0·550	10·414	10·201	78·574	77·027
28	2 45 44·0	18	552·444	0·625	11·366	10·244	78·594	65·295
29	2 54 50·0	19	552·105	0·562	11·210	10·233	78·594	65·195
30	2 45 35·0	18	551·944	0·647	10·879	10·221	78·594	65·508
31	3 4 12·0	20	552·600	0·526	10·605	10·214	78·594	66·026
32	2 45 9·0	18	550·500	0·620	10·998	10·255	78·594	64·574
33	2 45 9·0	18	550·500	0·664	10·554	10·235	78·594	65·042
34	2 45 14·5	18	550·806	0·578	10·291	10·226	78·594	65·384
35	2 54 42·0	19	551·684	0·621	10·520	10·243	78·594	65·715
36	2 45 36·0	18	552·000	0·655	11·865	10·333	78·585	64·665
37	2 45 43·0	18	552·389	0·634	11·315	10·308	78·585	65·389
38	2 54 46·0	19	551·895	0·634	10·808	10·284	78·585	65·592
39	2 46 5·5	18	553·639	0·529	10·617	10·274	78·585	66·644
40	2 46 0·0	18	553·333	0·574	11·810	10·345	78·585	65·405

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Appendix. Table VI.—South Shetland.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	−	+	+	
41	2 55 10·5	19	553·184	0·570	11·463	10·328	78·585	86165·647
42	3 4 14·0	20	552·700	0·595	11·252	10·321	78·585	65·602
43	2 45 44·0	18	552·444	0·587	11·252	10·322	78·585	65·450
44	2 45 55·5	18	553·083	0·595	11·738	10·352	78·604	65·383
45	2 45 50·5	18	552·806	0·634	11·379	10·335	78·604	65·607
46	2 54 49·5	19	552·079	0·600	10·689	10·307	78·604	65·824
47	2 54 37·5	19	551·447	0·510	10·575	10·303	78·604	65·484
48	2 45 48·5	18	552·694	0·634	11·053	10·324	78·634	65·889
49	2 45 44·0	18	552·444	0·634	10·237	10·282	78·634	66·521
50	2 45 41·0	18	552·278	0·616	9·844	10·262	78·634	66·782
51	2 36 27·5	17	552·206	0·616	9·784	10·261	78·634	66·801
52	2 45 58·5	18	553·250	0·595	11·358	10·351	78·654	65·906
53	2 46 5·0	18	553·611	0·579	11·252	10·350	78·654	66·199
54	2 46 14·5	18	554·139	0·553	11·167	10·350	78·654	66·555
55	2 55 28·0	19	554·105	0·566	11·040	10·349	78·654	66·675
56	2 45 58·5	18	553·250	0·494	10·922	10·372	78·654	66·262
57	2 45 41·0	18	552·278	0·574	10·343	10·340	78·654	66·339
58	2 45 31·0	18	551·722	0·587	10·258	10·335	78·853	66·316
59	2 45 52·0	18	552·889	0·595	11·252	10·388	79·042	66·233
60	2 45 48·0	18	552·667	0·612	10·584	10·350	79·042	66·765
61	2 45 12·5	18	550·694	0·642	9·720	10·303	79·042	66·481
62	2 45 9·5	18	550·528	0·549	9·623	10·298	79·042	66·384
	173 23 44·0	1127					Mean =	86166·891
							Add for height above the Sea =	0·063
								86166·954
			Iron Pendulum (Knife edge A).					
				+	−	+	+	
1	2 50 21·0	18	567·833	0·623	5·645	13·606	160·373	86264·642
2	2 40 56·0	17	568·000	0·693	5·434	13·588	160·373	64·595
3	2 41 10·5	17	568·853	0·689	7·091	13·785	159·816	63·430
4	2 41 2·5	17	568·382	0·830	6·696	13·751	159·816	63·680
5	2 50 42·0	18	569·000	0·550	6·572	13·757	159·816	63·860

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APPENDIX. TABLE VI.—South Shetland.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	−	+	+	
6	2 40 55·5	17	567·971	0·619	7·229	13·836	159·247	86262·232 *
7	2 41 4·5	17	568·500	0·647	6·783	13·786	159·247	62·939
8	2 40 53·5	17	567·853	0·737	6·327	13·736	159·247	63·089
9	2 50 16·5	18	567·583	0·719	5·976	13·698	159·247	63·239
10	2 40 46·5	17	567·441	0·702	6·797	13·772	161·279	64·431
11	2 50 8·5	18	567·139	0·714	6·466	13·732	161·279	64·572
12	2 59 41·5	19	567·447	0·712	6·227	13·698	161·279	64·940
	33 7 58·5	210		(First Series,	omitting	Exp. 6)	Mean =	86263·870
13	2 40 34·5	17	566·735	0·644	6·912	13·595	160·731	86263·153
14	2 40 59·0	17	568·176	0·770	6·696	13·525	160·733	64·201
15	2 50 27·0	18	568·167	0·776	6·509	13·478	160·732	64·341
	8 12 0·5	52			(Second Series)		Mean =	86263·898
	41 19 59·0	262	.....	....	....	General	Mean =	86263·936
					Add for height above the Sea =			0·063
								86263·999
				(Knife edge B).				
1	2 41 3·0	17	568·412	0·712	6·696	14·633	161·011	86265·655
2	2 41 13·5	17	569·029	0·636	5·990	14·568	161·012	66·550
3	2 41 3·5	17	568·441	0·818	7·133	14·630	160·732	65·057
4	2 41 6·5	17	568·618	0·663	6·976	14·591	160·734	65·117
5	2 50 37·5	18	568·750	0·818	6·817	14·551	160·734	65·439
6	2 41 12·5	17	568·971	0·776	6·990	14·508	160·464	65·051
7	2 41 8·0	17	568·706	0·814	6·624	14·467	160·464	65·273
8	2 41 15·5	17	569·147	0·779	6·400	14·442	160·464	65·672
9	2 22 25·0	15	569·667	0·700	6·255	14·426	160·460	66·000 †

* The adjustments, by accident, were deranged after the commencement of this experiment: the adjustment of the telescope only, I mean.—F. As there appears to be some discordance in the result, this set is rejected.—B.

† At the time of taking the last coincidence, the weather was exceedingly thick, and the room so dark that I could not read the arc of vibration: and upon the whole it is an observation I do not rely much upon.—F. I have however retained it.—B.

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Appendix. Table VI.—South Shetland.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	−	+	+	
10	2 41 12·5	17	568·971	0·814	6·826	14·481	160·554	86265·317
11	2 41 10·5	17	568·853	0·830	6·595	14·457	160·554	65·477
12	2 41 24·5	17	569·676	0·650	6·422	14·441	160·554	65·892
13	2 31 51·5	16	569·469	0·893	6·471	14·446	160·554	65·981
14	2 50 36·0	18	568·667	0·850	7·033	14·546	160·644	65·138
15	2 41 11·5	17	568·912	0·898	6·889	14·542	160·644	65·457
16	2 41 15·5	17	569·147	0·784	6·595	14·520	160·644	65·740
	42 51 47·0	271					Mean =	86265·551
					Add for height above the Sea =			0·063
								86265·614
			Copper Pendulum (Knife edge A).					
1	2 35 51·5	16	584·469	0·969	9·409	11·624	160·837	86268·367
2	3 24 56·0	21	585·524	0·570	9·186	11·589	160·837	68·689
3	2 56 9·0	18	587·167	0·684	11·009	11·622	161·020	68·023
4	2 46 19·0	17	587·000	0·823	10·928	11·638	161·020	68·175
5	2 55 50·5	18	586·139	0·917	10·806	11·660	161·019	67·980
6	2 46 15·0	17	586·765	0·687	10·875	11·871	161·199	68·386
7	2 46 5·0	17	586·176	0·693	10·183	11·853	161·198	68·769
8	2 45 56·0	17	585·647	0·617	9·572	11·839	161·198	69·023
9	2 45 51·5	17	585·382	0·877	9·308	11·900	161·125	69·402 *
	25 43 13·5	158			(Omitting Exp. 9.)		Mean =	86268·426
					Add for height above the Sea =			0·063
								86268·489
			(Knife edge B).					
1	2 45 9·5	17	582·912	0·737	10·427	12·597	161·374	86267·838
2	2 54 40·0	18	582·222	0·848	9·748	12·548	161·374	68·228
3	2 45 15·5	17	583·265	0·570	9·117	12·497	161·374	69·061 †

* The iron stand of the pendulum, and the pendulm itself, exhibited a copious precipitation of moisture upon them.—F. As it is discordant with the rest, I have rejected it.—B.

† The pendulum, and every part of the apparatus, covered with a copious precipitation of moisture.—F. This experiment is consequently rejected.—B.

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APPENDIX. TABLE VI.—South Shetland.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	−	+	+	
4	2 44 47·5	17	581·618	0·924	9·667	12·452	161·254	86267·860
5	2 44 41·5	17	581·265	0·848	9·227	12·419	161·253	68·010
6	2 44 48·0	17	581·647	0·819	8·608	12·375	161·254	68·752
7	2 35 40·0	16	583·750	0·833	10·733	12·537	161·127	67·747
8	3 4 47·0	19	583·526	0·716	10·643	12·531	161·127	67·600
9	2 55 5·0	18	583·611	0·838	10·386	12·512	161·126	68·002
10	3 14 23·5	20	583·175	0·731	10·285	12·577	161·125	67·839
	28 29 17·5	176			(Omitting	Exp. 3.)	Mean =	86267·986
					Add for hei	ght above	the Sea =	0·063
								86268·049

Cape Horn.

Pendulum No. 10.

				+	−	+	+	
1	2 33 6·0	22	417·545	0·676	9·657	10·346	45·053	86032·570 *
2	3 7 46·0	27	417·259	0·553	8·545	10·163	45·073	33·113
3	3 21 38·5	29	417·190	0·513	8·397	10·150	45·073	33·139
4	3 14 53·0	28	417·607	0·545	9·019	10·122	45·073	32·935
5	3 14 53·0	28	417·607	0·524	8·892	10·120	45·073	33·039
6	3 29 20·5	30	418·683	0·582	10·321	10·264	44·923	32·725 †
7	3 22 25·5	29	418·810	0·553	10·300	10·284	44·925	32·864
8	3 43 8·0	32	418·375	0·522	9·348	10·226	45·382	33·755
9	2 54 2·5	25	417·700	0·595	8·820	10·162	45·382	33·625
10	3 36 20·0	31	418·710	0·529	10·258	10·284	45·382	33·241
11	3 8 28·0	27	418·811	0·545	10·203	10·282	45·382	33·399
12	3 50 30·0	33	419·091	0·534	10·626	10·366	44·954	32·907
13	2 47 38·0	24	419·083	0·654	10·477	10·364	44·954	33·166
14	3 22 12·5	29	418·362	0·538	9·530	10·208	44·954	33·033

* After this experiment, it was found that the pendulum of experiment did not oscillate in a plane parallel to that of the pendulum of the clock; it was therefore unhung, and the stand adjusted for that purpose: but the day closed in too soon for obtaining the afternoon observations.—F.

† Notwithstanding the severity of the gales, &c.—(See this note, in page 53.)

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Appendix. Table VI.—Cape Horn.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	−	+	+	
15	3 22 1·0	29	417·966	0·546	9·074	10·142	44·954	86033·137
16	3 22 31·5	29	419·017	0·545	10·439	10·288	44·954	32·955
17	3 43 28·5	32	419·016	0·529	10·355	10·286	44·954	33·020
18	3 22 22·5	29	418·707	0·529	9·844	10·141	44·954	33·081
19	3 22 2·5	29	418·017	0·546	9·170	10·124	44·954	33·094
20	3 15 9·5	28	418·182	0·506	9·221	10·199	44·954	33·221
21	3 21 59·0	29	417·897	0·529	9·010	10·220	44·954	33·194
22	3 21 58·5	29	417·879	0·529	8·841	10·133	44·954	33·258
	72 57 54·5	628					Mean =	86033·112
					Add for height above the Sea =			0·109
								86033·221
				Pendulum No. 11.				
1	2 38 8·5	17	558·147	0·582	8·714	10·338	44·869	86137·479 *
2	2 38 6·5	17	558·029	0·673	9·844	10·390	45·028	36·586
3	2 10 15·0	14	558·214	0·701	9·632	10·383	45·028	36·922
4	2 37 11·0	17	554·765	0·624	7·627	10·260	44·977	36·751 †
5	2 38 14·0	17	558·471	0·680	9·823	10·292	44·958	36·691 ‡
6	2 38 19·5	17	558·794	0·615	9·454	10·252	44·958	37·134
7	2 38 10·5	17	558·265	0·628	8·862	10·200	44·958	37·394
8	2 37 52·5	17	557·206	0·615	8·998	10·337	45·058	36·894
9	2 37 50·5	17	557·088	0·582	8·726	10·330	45·058	37·060
10	2 37 41·0	17	556·529	0·615	8·460	10·309	45·058	37·026
11	2 37 33·0	17	556·059	0·606	8·016	10·095	45·227	37·154
12	2 37 31·0	17	555·941	0·585	7·436	10·046	45·227	37·598
13	2 37 32·5	17	556·029	0·603	7·009	10·011	45·227	38·057 §

* After this experiment, the pendulum was re-adjusted, and the clock stopped for that purpose.—F.

† The pendulum had not been removed for nearly three days previous to these experiments: that is, it had not been unhung from the planes.—F.

‡ Before the commencement of this experiment, the pendulum was taken down, the planes dried, and the adjustments examined.—F.

§ The pendulum of experiment was copiously bedewed with moisture: so much so, that heavy and well defined drops of water were observable in different places, on the ball of the pendulum only. The support of the pendulum was also very moist.—F. This experiment is therefore rejected.—B.

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Appendix. Table VI.—Cape Horn.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	−	+	+	
14	2 36 59·5	17	554·088	0·637	7·276	10·023	45·176	86136·696 *
15	2 55 30·5	19	554·237	0·549	7·351	10·089	45·176	36·683
16	2 46 19·0	18	554·389	0·570	7·508	10·138	45·176	36·682
17	2 46 41·5	18	555·639	0·658	8·651	10·260	44·937	36·211
18	2 37 26·0	17	555·647	0·597	8·249	10·224	44·937	36·520
19	2 46 29·0	18	554·944	0·612	7·839	10·185	44·937	36·513
20	2 37 35·0	17	556·176	0·640	8·756	10·119	44·679	35·989
21	2 37 34·5	17	556·147	0·568	8·481	10·076	44·679	36·132
22	2 46 47·0	18	555·944	0·582	8·554	10·053	44·679	35·938
23	2 47 1·0	18	556·722	0·553	8·651	10·161	44·350	36·025
24	2 46 54·5	18	556·361	0·612	8·236	10·155	44·350	36·291
25	2 37 22·0	17	555·412	0·637	7·847	10·076	45·058	36·804
26	2 46 24·0	18	554·668	0·607	7·520	10·055	45·058	36·662
27	2 37 26·5	17	555·676	0·585	7·415	10·042	45·058	37·298
	71 50 55·5	465			(Omitting Exp. 13.)		Mean =	86136·736
					Add for height above the Sea =			0·109
								86136·845

Cape of Good Hope.

Pendulum No. 10.

				+	−	+	−	
1	3 27 40·5	29	429·672	0·562	1·832	10·098	59·790	85946·871
2	3 41 48·5	31	429·306	0·514	1·460	10·073	59·790	46·827
3	2 37 18·0	22	429·000	0·522	1·121	10·048	59·790	46·862
4	2 37 18·5	22	429·023	0·560	1·396	10·010	60·288	46·111
5	2 37 12·5	22	428·750	0·551	1·028	10·002	60·288	46·205
6	2 44 21·0	23	428·739	0·537	0·931	10·015	60·288	46·290
7	2 37 19·5	22	429·068	0·606	1·535	10·062	60·775	45·625
8	2 37 16·5	22	428·932	0·568	1·354	10·052	60·775	45·630
9	2 37 12·5	22	428·750	0·606	1·163	10·033	60·775	45·669
10	2 52 27·0	24	431·125	0·545	1·502	10·046	61·065	47·210

* Dried the pendulum, examined the adjustments, and, finding all correct, recommenced.—F.

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Appendix. Table VI.—Cape of Good Hope.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
			Pendulum No. 11.					
	h m s		s	+	−	+	−	
11	2 37 59·0	22	430·864	0·619	1·417	10·037	61·065	85947·119
12	3 35 24·5	30	430·817	0·498	1·565	10·045	61·065	46·814
13	2 38 30·5	22	432·295	0·486	2·475	10·203	60·946	47·541
14	3 7 4·5	26	431·712	0·517	2·081	10·190	60·946	47·413
15	2 45 22·0	23	431·391	0·511	1·840	10·180	60·946	47·340
16	3 28 44·0	29	431·862	0·453	2·475	10·235	60·877	47·208
17	2 23 48·0	20	431·400	0·615	2·178	10·210	60·877	47·213
18	2 52 26·5	24	431·104	0·591	2·073	10·195	60·877	47·005
	51 59 13·5	435				(First Series)	Mean =	85946·720
19	2 37 48·5	22	430·386	0·580	2·411	10·106	60·796	85945·979
20	2 52 2·5	24	430·104	0·561	2·115	10·078	60·796	45·965
21	2 44 46·5	23	429·848	0·511	1·811	10·041	60·796	45·943
22	2 8 54·0	18	429·667	0·629	1·671	10·016	60·796	46·006
23	3 6 4·5	26	429·404	0·486	1·425	9·990	60·795	45·838
24	2 44 27·5	23	429·022	0·528	1·142	9·965	60·795	45·780 *
25	2 44 24·5	23	428·891	0·537	1·129	9·962	60·795	45·675
	18 58 28·0	159				(Second Series)	Mean =	85945·883
	70 57 41·5	594	.....	....	....	General	Mean =	85946·486
						Add for height above the Sea =		0·091
								85946·577
			Pendulum No. 11.					
1	3 3 3·5	19	578·079	0·529	1·925	10·128	60·031	86049·780
2	3 2 49·0	19	577·316	0·616	1·598	10·108	60·031	49·779
3	3 2 50·0	19	577·368	0·506	1·451	10·091	60·031	49·826
4	3 2 51·5	19	577·447	0·536	1·683	10·099	59·752	49·952
5	3 2 46·5	19	577·184	0·562	1·493	10·065	59·752	49·997

* These two last observations cannot be applied to any purpose; as the rate of the clock, during their continuance, was not ascertained: the weather proving cloudy.—F. I see no doubt as to the propriety of retaining these two experiments, as ζ *Aquilæ* was observed on the afternoon of Sept. 4; and the clock rate appears to have been very uniform.—B.

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APPENDIX. TABLE VI.—Cape of Good Hope.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	−	+	−	
6	3 21 57·5	21	577·024	0·549	1·311	10·022	59·752	86050·040
7	3 12 20·5	20	577·025	0·574	1·544	10·027	59·792	49·798
8	3 2 44·5	19	577·079	0·517	1·417	10·027	59·792	49·896
9	3 12 18·5	20	576·925	0·603	1·354	10·036	59·792	49·974
10	3 41 36·5	23	578·109	0·545	2·136	10·063	59·832	49·734
11	3 22 16·0	21	577·905	0·557	1·726	10·036	59·832	50·024
12	3 12 31·5	20	577·575	0·546	1·544	10·021	59·832	50·009
13	3 12 40·5	20	578·025	0·566	1·912	10·071	59·932	49·844
14	2 14 43·0	14	577·357	0·751	1·577	10·051	59·932	49·998
15	3 12 45·0	20	578·250	0·579	1·946	10·186	59·932	50·054
16	3 12 37·0	20	577·850	0·587	1·692	10·177	59·932	50·100
17	2 33 57·5	16	577·344	0·628	1·510	10·163	59·932	50·047
	52 46 48·5	331					Mean =	86049·932
					Add for height above the Sea =			0·091
								86050·023
			Iron Pendulum (Knife edge A).					
			Perpendicular to the plane of the Magnetic meridian.					
				+	+	+	+	
1	2 34 29·5	18	514·972	0·946	0·129	13·392	71·910	86150·825
2	2 42 59·5	19	514·711	1·021	0·244	13·377	71·910	50·829
3	3 43 4·5	26	514·788	1·034	0·417	13·349	71·910	51·038
4	2 0 7·5	14	514·821	0·970	0·513	13·332	71·910	51·074
5	2 51 35·5	20	514·775	1·063	0·158	13·358	71·889	50·787
6	2 0 0·5	14	514·321	1·211	0·282	13·349	71·889	50·754
7	1 59 59·0	14	514·214	1·265	0·403	13·332	71·889	50·842
8	1 59 52·0	14	513·714	1·541	0·561	13·306	71·889	50·923
9	2 43 3·5	19	514·921	0·919	0·705	13·286	71·889	51·213
10	1 8 34·0	8	514·250	1·240	0·787	13·276	71·889	51·168
11	2 0 7·0	14	514·786	1·116	0·388	13·320	71·531	50·681
12	2 0 12·0	14	515·143	0·824	0·455	13·313	71·531	50·682
13	2 8 43·0	15	514·867	0·944	0·576	13·298	71·531	50·728
14	2 0 2·5	14	514·464	1·186	0·729	13·274	71·531	50·833
15	2 17 19·0	16	514·938	0·946	0·835	13·253	71·531	50·991
16	2 0 7·0	14	514·786	1·092	0·873	13·242	71·531	51·064
	36 10 16·0	253				(First Series)	Mean =	86510·903

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Appendix. Table VI.—Cape of Good Hope.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
			In the plane of the Magnetic meridian.					
	h m s		s	+	+	+	+	
17	2 19 25·5	16	522·844	1·001	0·787	13·264	65·698	86150·249 *
18	2 19 38·5	16	523·656	0·843	0·950	13·246	65·698	50·749
19	2 10 42·5	15	522·833	0·962	1·116	13·216	65·698	50·484
20	1 53 7·5	13	522·115	1·174	1·238	13·186	65·698	50·335
21	2 28 3·0	17	522·529	0·920	1·263	13·162	65·698	50·343
22	2 19 19·0	16	522·438	1·125	0·945	13·229	65·598	50·140
23	2 19 27·5	16	522·969	1·125	1·060	13·229	65·598	50·590
24	2 19 19·5	16	522·469	1·012	1·210	13·218	65·598	50·300
25	2 28 3·5	17	522·559	0·980	1·354	13·209	65·598	50·460
26	2 19 22·0	16	522·625	0·814	1·396	13·207	65·598	50·376
27	2 23 8·5	17	522·853	0·980	0·893	13·287	65·588	50·253 †
28	2 10 46·0	15	523·067	0·968	0·887	13·304	65·588	50·357
	27 35 23·0	190			(Second Series)		Mean =	86150·386
	63 45 39·0	443	.....	....	....	General	Mean =	86150·681
					Add for height above the Sea =			0·091
								86150·772
			(Knife edge B).					
			Perpendicular to the plane of the Magnetic meridian.					
1	2 8 44·0	15	514·933	1·088	0·541	14·027	72·338	86152·416
2	2 8 43·0	15	514·867	1·135	0·634	14·024	72·338	52·510
3	2 8 47·5	15	515·167	0·959	0·787	14·007	72·338	52·666
4	2 8 53·0	15	515·533	0·955	0·959	13·987	72·338	53·051
5	2 26 1·0	17	515·353	1·034	1·051	13·995	72·338	53·114
6	1 17 12·5	9	514·722	1·447	1·017	14·016	72·338	53·102
7	2 17 33·5	16	515·844	0·867	0·585	14·088	71·591	52·146
8	2 26 4·5	17	515·559	0·905	0·662	14·091	71·591	52·078
9	2 25 57·0	17	515·118	1·072	0·778	14·075	71·591	52·059

* Before the iron pendulum was placed in the Y's, on this occasion, it was observed that the iron screw, at the end B, was loose: and which I tightened with my hand, using no instrument for that purpose.—F.

† The last two experiments were made after the experiments on the knife edge B had been completed.—B.

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APPENDIX. TABLE VI.—Cape of Good Hope.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	+	
10	3 0 26·5	21	515·548	0·786	0·864	14·060	71·591	86152·123
11	2 17 27·0	16	515·438	0·936	0·873	14·057	71·591	52·208
12	2 17 30·0	16	515·625	0·983	0·532	14·114	71·820	52·321
13	2 17 28·5	16	515·531	0·983	0·648	14·108	71·820	52·370
14	2 8 50·5	15	515·367	1·064	0·758	14·097	71·820	52·444
15	2 8 48·0	15	515·200	1·128	0·835	14·086	71·820	52·465
16	2 26 5·5	17	515·618	0·910	0·878	14·077	71·820	52·553
	36 4 32·0	252				(First Series)	Mean =	86152·238
			In the plane of the Magnetic meridian.					
17	2 19 38·0	16	523·625	0·931	0·801	14·122	65·818	86151·665
18	2 37 11·5	18	523·972	1·090	0·887	14·120	65·818	52·126
19	2 28 22·0	17	523·647	0·990	0·950	14·116	65·818	51·880
20	2 28 20·0	17	523·529	1·045	1·022	14·101	65·818	51·918
21	2 28 24·0	17	523·765	0·962	1·002	14·100	65·818	51·963
22	2 19 44·0	16	524·000	0·915	0·585	14·098	65·668	51·495
23	2 28 37·0	17	524·529	0·936	0·671	14·086	65·668	51·922
24	2 37 7·5	18	523·750	1·067	0·820	14·059	65·668	51·685
25	2 2 8·5	14	523·464	1·140	0·893	14·038	65·668	51·630
26	2 19 38·0	16	523·625	1·125	0·916	14·031	65·668	51·732
27	2 46 6·0	19	524·526	0·842	0·628	14·097	65·589	51·715
28	2 28 32·0	17	524·235	0·974	0·720	14·106	65·589	51·766
	29 23 48·5	202				(Second Series)	Mean =	86151·791
	65 28 20·5	454	.....	....	....	General	Mean =	86152·183
						Add for height above the Sea =		0·091
								86152·274
			Copper Pendulum (Knife edge A).					
			Perpendicular to the plane of the Magnetic meridian.					
				+	−	+	+	
1	2 29 17·0	17	526·882	1·113	0·395	11·622	71·826	86156·198
2	2 20 28·0	16	526·750	0·988	0·204	11·614	71·826	56·174
3	2 29 8·0	17	526·353	1·084	+0·114	11·594	71·826	56·321
4	2 29 9·5	17	526·441	0·994	0·386	11·568	71·826	56·532
5	2 29 13·5	17	526·676	0·946	0·582	11·549	71·826	56·817

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Appendix. Table VI.—Cape of Good Hope.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	+	
6	2 29 14·5	17	526·735	1·011	0·061	11·561	71·407	86155·981
7	2 29 12·5	17	526·618	0·905	0·285	11·552	71·407	56·017
8	2 20 23·0	16	526·438	0·856	0·549	11·527	71·407	56·095
9	2 20 17·5	16	526·094	1·010	0·766	11·505	71·407	56·230
10	2 29 7·0	17	526·294	0·894	0·915	11·492	71·407	56·374
11	2 29 14·0	17	526·706	1·034	0·521	11·513	71·169	56·160
12	2 29 15·5	17	526·794	0·988	0·671	11·503	71·169	56·309
13	2 29 17·0	17	526·882	0·818	0·936	11·478	71·169	56·433
14	2 38 0·0	18	526·667	1·007	1·152	11·455	71·169	56·682
15	2 20 23·5	16	526·469	1·116	1·314	11·437	71·169	56·811
	36 51 40·5	252			(First Series)		Mean =	86156·342
			In the plane of the Magnetic meridian.					
16	2 31 24·5	17	534·382	0·962	0·712	11·586	65·603	86155·499
17	2 31 28·5	17	534·618	1·062	0·855	11·573	65·603	55·871
18	2 31 24·0	17	534·353	0·848	1·140	11·536	65·603	55·745
19	2 40 14·5	18	534·139	1·011	1·233	11·516	65·603	55·852
20	2 22 27·0	16	534·188	1·011	0·969	11·514	65·284	55·297
21	2 40 23·5	18	534·639	0·746	1·192	11·498	65·284	55·511
22	2 31 12·5	17	533·676	1·029	1·444	11·475	65·284	56·045
23	2 40 8·0	18	533·778	0·930	1·587	11·460	65·284	55·531
	20 28 42·5	138			(Second Series)		Mean =	86155·669
	57 20 23·0	390	.....	....	....	General	Mean =	86156·108
					Add for height above the Sea=			0·091
								86156·199
			(Knife edge B).					
			Perpendicular to the plane of the Magnetic meridian.					
1	2 28 31·0	17	524·176	1·116	1·160	12·012	71·068	86155·696
2	2 54 41·5	20	524·075	1·177	1·295	12·010	71·068	55·826
3	2 46 0·0	19	524·211	1·034	1·485	11·994	71·068	55·942
4	2 37 13·0	18	524·056	0·978	1·628	11·984	71·068	55·922
5	1 44 44·0	12	523·667	1·045	1·669	11·987	71·068	55·788
6	2 28 33·0	17	524·294	0·966	1·200	12·045	70·988	55·613

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APPENDIX. TABLE VI.—Cape of Good Hope.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	+	+	+	
7	2 28 28·0	17	524·000	1·036	1·254	12·047	70·988	86155·554
8	2 37 7·0	18	523·722	1·130	1·396	12·041	70·988	55·609
9	2 28 20·5	17	523·559	1·164	1·539	12·026	70·988	55·668
10	2 28 27·0	17	523·941	0·944	1·607	12·019	70·988	55·750
11	2 28 31·5	17	524·206	1·112	1·200	12·100	70·988	55·758
12	2 28 28·0	17	524·000	1·088	1·363	12·090	70·988	55·758
13	2 37 6·5	18	523·694	1·153	1·580	12·073	70·988	55·830
14	2 37 7·5	18	523·750	1·078	1·770	12·048	70·988	55·955
15	2 28 19·5	17	523·500	1·123	1·946	12·030	70·988	56·001
	37 41 38·0	259			(First Series)		Mean =	86155·778
			In the plane of the Magnetic meridian.					
16	2 30 51·0	17	532·412	0·837	1·173	12·088	65·214	86154·746
17	2 39 36·5	18	532·028	1·001	1·436	12·070	65·214	54·926
18	2 30 32·0	17	531·294	1·101	1·803	12·036	65·214	54·910
19	2 48 12·0	19	531·158	1·034	2·076	12·006	65·214	55·003
20	2 30 38·0	17	531·647	1·000	1·966	11·998	65·214	55·150
21	2 39 31·0	18	531·722	1·068	2·250	11·977	65·214	55·527
22	2 39 17·0	18	530·944	1·056	2·768	11·940	65·214	55·520
23	2 56 54·0	20	530·700	0·914	3·093	11·914	65·214	55·527
	21 15 31·5	144			(Second Series)		Mean =	86155·164
	58 57 9·5	403	.....	....	....	General	Mean =	86155·564
					Add for height above the Sea =			0·091
								86155·654

St. Helena.

Pendulum No. 10.

				+	+	+	−	
1	2 49 43·0	24	424·292	0·624	5·888	9·696	106·197	85902·743
2	3 10 52·5	27	424·167	0·533	6·007	9·694	106·197	2·554
3	2 42 27·5	23	423·804	0·557	6·142	9·682	106·197	2·448
4	2 42 23·5	23	423·630	0·603	6·189	9·674	106·197	2·365

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Appendix. *Table VI.—St. Helena.*

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	−	
5	2 35 39·0	22	424·500	0·640	5·880	9·699	105·510	85903·642
6	2 35 34·0	22	424·273	0·589	5·956	9·697	105·510	3·447
7	2 35 31·0	22	424·136	0·658	6·070	9·688	105·510	3·489
8	2 35 31·0	22	424·136	0·619	6·163	9·677	105·510	3·532
9	1 45 56·0	15	423·733	0·767	6·167	9·675	105·510	3·295
10	2 56 45·0	25	424·200	0·549	5·787	9·702	105·470	3·213
11	2 49 41·5	24	424·229	0·553	5·967	9·700	105·470	3·323
12	2 56 42·0	25	424·080	0·565	6·028	9·687	105·470	3·340
13	2 56 41·5	25	424·060	0·549	6·100	9·679	105·470	3·369
14	2 56 40·0	25	424·000	0·578	5·731	9·706	105·191	3·277
15	2 56 37·5	25	423·900	0·578	5·816	9·705	105·191	3·265
16	2 56 33·0	25	423·720	0·591	6·058	9·689	105·191	3·330
17	3 3 36·0	26	423·692	0·570	6·121	9·680	105·191	3·336
18	2 56 44·5	25	424·180	0·513	5·808	9·697	105·540	3·104
19	3 3 45·0	26	424·038	0·517	5·858	9·696	105·540	3·020
20	2 56 37·5	25	423·900	0·587	6·028	9·685	105·540	3·117
21	3 3 40·0	26	423·846	0·582	6·091	9·685	105·540	3·123
	59 7 41·0	502					Mean =	85903·159
					Add for height above the Sea =			0·084
								85903·243
				Pendulum No. 11.				
1	2 59 51·5	19	567·975	0·502	5·985	9·688	105·697	86006·240
2	2 59 50·5	19	567·921	0·600	6·079	9·684	105·697	6·399
3	2 59 47·5	19	567·763	0·536	6·121	9·681	105·697	6·289
4	3 9 19·0	20	567·950	0·579	5·994	9·688	105·716	6·293
5	3 9 13·5	20	567·675	0·513	6·091	9·683	105·716	6·172
6	2 59 41·0	19	567·421	0·574	6·133	9·673	105·716	6·128
7	3 9 6·0	20	567·300	0·509	6·185	9·663	105·716	6·040
8	2 59 55·5	19	568·158	0·524	6·125	9·682	105·497	6·673
9	2 59 47·5	19	567·763	0·604	6·176	9·679	105·497	6·610
10	2 59 45·5	19	567·658	0·574	6·336	9·670	105·497	6·674
11	2 59 41·5	19	567·447	0·536	6·303	9·670	105·497	6·490

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Appendix. Table VI.—St. Helena.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	+	+	−	
12	2 59 46·5	19	567·711	0·565	6·125	9·693	105·516	86006·487
13	2 50 9·0	18	567·167	0·599	6·176	9·695	105·516	6·282
14	2 59 36·5	19	567·184	0·536	6·332	9·678	105·516	6·367
15	2 59 31·5	19	566·921	0·565	6·417	9·667	105·516	6·328
16	2 40 47·0	17	567·471	0·553	6·176	9·693	105·506	6·407
17	3 9 0·5	20	567·025	0·570	6·303	9·686	105·506	6·304
18	2 59 37·5	19	567·237	0·595	6·430	9·673	105·506	6·557
19	2 59 39·0	19	567·316	0·502	6·514	9·662	105·506	6·580
20	3 9 4·0	20	567·200	0·587	6·290	9·681	105·487	6·416 *
21	2 59 30·5	19	566·868	0·565	6·345	9·681	105·487	6·271
22	2 59 26·0	19	566·632	0·574	6·472	9·667	105·487	6·266
23	2 59 21·5	19	566·395	0·595	6·586	9·662	105·487	6·269
24	2 59 34·0	19	567·053	0·565	6·375	9·679	105·487	6·408
	72 11 2·5	458					Mean=	86006·373
					Add for height above		the Sea=	0·084
								86006·457
			Copper Pendulum (Knife edge A).					
				+	+	+	+	
1	2 23 15·5	16	537·219	1·142	6·138	11·198	16·628	86113·449
2	2 59 8·5	20	537·425	0·941	6·423	11·178	16·618	13·626
3	2 59 20·5	20	538·025	0·705	6·423	11·177	16·618	13·748
4	2 59 22·0	20	538·100	0·941	6·646	11·159	16·618	14·234
5	3 8 11·0	21	537·667	0·650	6·768	11·150	16·618	13·797 †
6	2 32 20·0	17	537·647	0·930	6·423	11·170	16·618	13·740
7	4 2 3·5	27	537·907	0·777	6·524	11·162	16·618	13·834
8	2 50 22·0	19	538·000	0·917	6·695	11·152	16·618	14·192
9	3 16 56·5	22	537·114	0·875	6·727	11·151	16·618	13·651
	27 10 59·5	182					Mean =	86113·808
					Add for height above		the Sea=	0·084
								86113·892

* The surf uncommonly high; and I fancied that, on one or two occasions, the ground underneath shook from the violence of the surge. Placed a basin of quicksilver on the block of the pendulum support.—F.

† Indifferent observation: day-light too feeble for exact observance of coincidences.—F.

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Appendix. Table VI.—St. Helena.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
			(Knife edge B).					
	h m s		s	+	+	+	+	
1	2 58 13·5	20	534·675	0·852	5·962	11·808	17·076	86112·511
2	2 58 6·5	20	534·325	1·024	6·036	11·803	17·076	12·540
3	2 58 28·5	20	535·425	0·893	6·166	11·793	17·076	13·193
4	2 58 2·5	20	534·125	1·106	6·239	11·786	17·076	12·687
5	2 58 16·5	20	534·825	0·906	5·913	11·810	17·116	12·648 *
6	3 7 10·0	21	534·762	0·776	5·942	11·810	17·116	12·509
7	2 58 26·5	20	535·325	0·882	6·268	11·784	17·116	13·255
8	3 7 2·0	21	534·381	0·889	6·158	11·784	17·116	12·582
9	2 58 11·5	20	534·575	0·900	5·995	11·781	16·717	12·145
10	3 7 3·5	21	534·452	0·958	6·057	11·804	16·717	12·214
11	2 58 26·0	20	535·300	0·845	6·179	11·788	16·717	12·719
12	3 7 3·5	21	534·452	0·824	6·301	11·774	16·717	12·294
	36 14 30·5	244					Mean =	86112·608
					Add for height above the Sea =			0·084
								86112·692

Ascension Island.

Pendulum No. 10.

				+	+	+	−	
1	2 55 42·0	25	421·680	0·619	8·342	9·587	121·292	85887·466
2	2 48 42·5	24	421·771	0·650	8·511	9·575	121·292	87·742
3	2 34 44·0	22	422·000	0·670	8·388	9·577	121·292	87·864
4	3 2 58·0	26	422·231	0·591	7·838	9·606	121·203	87·577
5	2 55 41·0	25	421·640	0·629	8·240	9·587	121·203	87·424
6	3 44 49·5	32	421·547	0·466	8·536	9·570	121·203	87·450
7	1 52 19·5	16	421·219	0·753	8·692	9·561	121·203	87·565
8	3 9 47·0	27	421·741	0·591	7·982	9·595	120·963	87·474

* The clock belonging to the Admiralty, with which these experiments were made, has an escapement of the construction invented by Amant (à Cheville), once a clock maker in Paris: and is described in Rees's Encyclopædia, under the head of Escapement.—F. This note is inserted on the *cover* of the book which contains the account of this and the subsequent experiments.—B.

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APPENDIX. TABLE VI.—Ascension Island.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	−	
9	3 16 37·5	28	421·339	0·541	8·367	9·578	120·963	85887·391
10	2 55 25·0	25	421·000	0·549	8·701	9·557	120·963	87·393
11	2 20 16·5	20	420·825	0·708	8·841	9·548	120·963	87·512
12	2 20 31·5	20	421·575	0·636	8·008	9·591	121·012	87·331
13	3 23 37·0	29	421·276	0·612	8·282	9·579	121·012	87·278
14	3 2 24·5	26	420·942	0·557	8·575	9·564	121·012	87·176
15	2 34 17·5	22	420·795	0·673	8·680	9·558	121·012	87·258
16	3 16 39·0	28	421·393	0·579	8·173	9·587	121·012	87·258
17	2 55 23·5	25	420·940	0·599	8·515	9·573	121·012	87·165
18	2 55 17·5	25	420·700	0·549	8·765	9·558	121·012	87·116
19	2 13 13·0	19	420·684	0·500	8·777	9·554	121·012	87·059
	54 18 26·0	464					Mean =	85887·395
					Add for height above the Sea =			0·044
								85887·439
				Pendulum No. 11.				
1	2 39 50·0	17	564·117	0·615	8·198	9·584	121·448	85990·629
2	2 49 0·5	18	563·361	0·561	8·460	9·572	121·447	90·415
3	3 26 27·0	22	563·045	0·455	8·765	9·553	121·447	90·423
4	2 48 52·0	18	562·889	0·587	8·849	9·547	121·447	90·548
5	3 17 26·0	21	564·095	0·541	8·215	9·588	121·038	90·974
6	2 58 19·5	19	563·132	0·582	8·608	9·573	121·038	90·870
7	2 58 10·5	19	562·658	0·545	8·925	9·556	121·038	90·873
8	2 39 30·0	17	562·941	0·654	8·765	9·560	121·038	90·982
9	2 58 33·0	19	563·842	0·574	8·185	9·590	121·646	90·234
10	3 26 31·0	22	563·227	0·526	8·490	9·577	121·646	90·143
11	2 58 11·5	19	562·711	0·574	8·807	9·558	121·646	90·208
12	2 39 31·0	17	563·000	0·603	8·811	9·556	121·646	90·397
13	3 17 23·5	21	563·976	0·550	8·113	9·596	121·149	90·714
14	3 7 39·5	20	562·975	0·608	8·469	9·579	121·148	90·547
15	3 16 51·5	21	562·452	0·590	8·870	9·555	121·147	90·642
16	2 20 36·0	15	562·400	0·664	8·977	9·545	121·147	90·784
17	3 26 44·0	22	563·817	0·498	8·177	9·597	121·358	90·431
18	2 58 14·0	19	562·842	0·587	8·536	9·580	121·357	90·333

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Appendix. Table VI.—Ascension Island.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	−	
19	3 7 32·5	20	562·625	0·579	8·896	9·556	121·357	85990·542
20	2 20 41·5	15	562·707	0·633	8·959	9·550	121·357	90·698
21	3 27 41·0	22	566·409	0·545	8·100	9·597	121·439	91·723
22	2 59 6·0	19	565·584	0·562	8·397	9·584	121·439	91·579 *
23	3 27 29·5	22	565·886	0·486	8·490	9·574	121·439	91·749
24	1 52 31·5	12	562·625	0·787	8·409	9·575	121·437	90·202
25	2 11 4·0	14	561·714	0·667	8·777	9·547	121·167	90·194 †
26	3 7 46·0	20	563·333	0·530	8·185	9·585	121·168	90·386
	76 39 42·5	490					Mean =	85990·662
							Add for height above the Sea =	0·044
								85990·706
			Iron Pendulum (Knife edge A).					
				+	+	+	−	
1	2 57 17·0	20	531·850	0·673	5·875	12·767	3·238	86091·173 ‡
2	2 31 6·5	17	533·324	0·784	6·100	12·751	3·238	92·391

* These three observations, differing so considerably from any others taken, the pendulum was removed from the planes, to examine the adjustments; which were found correct. The planes were then wiped, and the pendulum rubbed gently with a silk handkerchief, to remove any dust, &c.: it was then replaced, and the subsequent experiment made, which agrees with the former ones made prior to March 4. Query, the cause?—F. See my remarks on this note in page 58.—B.

† In consequence of the discordancy in the experiments of March 4 [just alluded to] these experiments were made, after the experiments with Pendulum No. 10 were concluded, in order to ascertain, if possible, the cause of the anomalies alluded to. The experiment, on the afternoon of March 12, was made with the usual care and attention to the adjustments that have ever been practised; and that on the morning of March 13, was made when the pendulum of experiment had its knife edge laid somewhat oblique to the direction of the Y's on the agate planes. This trial was made for the purpose of seeing what effect a slight inclination, of the sort described, would produce on the interval of coincidences. But so far as the experiment goes, it does not appear to have any perceptible effect on the interval; inasmuch as the result is in accordance with those intervals obtained under the same degree of temperature nearly: and therefore I am at a loss for an explanation of the anomalies observed on March 4; unless indeed the rate of the clock may have undergone a change during the experiments in question, or that a wrong minute of time is recorded in the observations.—F.

‡ This observation is not to be depended upon, as the adjustment of the telescope was not quite accurate at the time of the latter coincidences.—F. On this account, and because it is discordant with the rest, I have rejected it.—B.

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APPENDIX. TABLE VI.—Ascension Island.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	−	
3	2 39 42·5	18	532·361	0·740	6·278	12·727	3·238	86091·915
4	2 48 21·5	19	531·658	0·725	6·292	12·718	3·238	91·476
5	2 30 49·0	17	532·294	0·750	5·798	12·791	2·700	92·006
6	2 40 2·5	18	533·472	0·755	6·100	12·759	2·700	92·998
7	2 30 52·0	17	532·471	0·784	6·292	12·736	2·700	92·587
8	2 30 35·5	17	531·500	0·784	6·316	12·728	2·700	92·010
9	2 48 49·5	19	533·132	0·670	6·206	12·740	2·959	92·534
10	2 4 16·0	14	532·571	0·823	6·244	12·731	2·959	92·375
	26 2 12·0	176			(Omitting	Exp. 1.)	Mean =	86092·255
					Add for hei	ght above	the Sea =	0·044
								86092·299
			(Knife edge B).					
1	2 48 30·5	19	532·132	0·675	5·841	13·573	3·088	86092·269
2	2 39 57·0	18	533·167	0·769	6·013	13·559	3·088	93·152
3	2 48 33·0	19	532·263	0·776	6·241	13·525	3·088	92·802
4	2 39 33·0	18	531·833	0·845	6·307	13·511	3·088	92·660
5	2 48 39·5	19	532·605	0·633	5·769	13·572	3·168	92·362
6	2 31 10·5	17	533·559	0·765	5·927	13·560	3·168	93·221
7	2 30 55·0	17	532·647	0·863	6·172	13·530	3·168	92·979
8	2 30 51·0	17	532·412	0·765	5·746	13·570	2·959	92·561
9	2 31 12·0	17	533·235	0·893	6·028	13·543	2·959	93·445
	23 49 21·5	161					Mean =	86092·828
					Add for hei	ght above	the Sea =	0·044
								86092·872
			Copper Pendulum (Knife edge A).					
1	2 33 30·0	17	541·765	0·899	8·241	11·064	3·258	86097·989
2	3 18 15·5	22	540·705	0·617	8·526	11·043	3·258	97·345
3	1 56 57·5	13	539·808	0·790	8·640	11·031	3·258	97·089
4	2 33 12·0	17	540·706	0·859	7·969	11·068	3·208	97·106
5	2 33 25·0	17	541·471	0·951	8·193	11·055	3·208	97·860

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Appendix. Table VI.—Ascension Island.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	−	
6	2 42 25·0	18	541·389	0·784	8·343	11·041	3·208	86097·781
7	2 42 11·0	18	540·611	0·803	8·355	11·034	3·208	97·346
8	2 33 24·0	17	541·412	0·884	7·867	11·085	3·328	97·343
9	2 33 45·5	17	542·676	0·839	8·214	11·068	3·328	98·371 *
10	2 51 32·0	19	541·684	0·792	8·567	11·047	3·328	98·073
11	2 33 8·5	17	540·500	0·824	8·722	11·035	3·328	97·549
	28 51 46·0	192			(First Series)		Mean =	86097·623
12	2 42 24·5	18	541·361	0·818	8·445	11·053	3·069	86098·052
13	2 33 9·5	17	540·559	0·664	8·640	11·030	3·069	97·596
14	2 32 58·5	17	539·902	0·804	8·722	11·015	3·069	97·414
	7 48 32·5	52			(Second Series)		Mean =	86097·687
	36 40 18·5	244	.....	....	....	General	Mean =	86097·637
					Add for height above the Sea =			0·044
								86097·681
			(Knife edge B).					
1	2 41 36·0	18	538·667	0·804	7·969	11·662	2·780	86096·862
2	2 50 51·0	19	539·526	0·775	8·303	11·643	2·780	97·659
3	2 32 30·0	17	538·235	0·833	8·661	11·618	2·780	97·282
4	2 41 16·5	18	537·583	0·789	8·832	11·603	2·780	97·005
5	2 50 30·5	19	538·447	0·784	8·079	11·662	2·660	96·941
6	2 41 35·5	18	538·639	0·873	8·336	11·647	2·660	97·387
7	2 50 12·5	19	537·500	0·775	8·689	11·624	2·660	96·939
8	2 41 6·0	18	537·000	0·962	8·873	11·610	2·660	96·997
9	2 50 12·5	19	537·500	0·930	8·132	11·660	2·630	96·604
10	2 32 27·5	17	538·088	0·995	8·396	11·644	2·630	97·267

* At the time of taking the last three coincidences, the adjustment of the two pendulums was found to have altered. The adjustments were again rendered perfect; but it would appear that some alteration in the rate of the clock, has notwithstanding taken place, the intervals having increased.—F.

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APPENDIX. TABLE VI.—Ascension Island.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	−	
11	2 41 19·0	18	537·722	0·940	8·689	11·615	2·630	86097·256
12	2 50 9·0	19	537·316	0·914	8·770	11·600	2·630	97·055
13	2 50 14·0	19	537·579	0·765	8·119	11·648	3·069	96·021
	35 34 0·0	238					Mean =	86097·021
					Add for height above		the Sea =	0·044
								86097·065
			At the Green Mountain.					
			Pendulum No. 10.					
				+	+	+	−	
1	2 34 28·5	22	421·295	0·728	5·858	8·963	126·218	85879·167
2	2 34 32·0	22	421·455	0·631	5·872	8·974	126·218	79·250
3	2 41 55·5	23	422·413	0·640	4·454	9·024	126·218	78·821
4	2 48 46·5	24	421·938	0·632	5·161	8·995	126·218	79·031
5	2 34 31·5	22	421·432	0·621	5·998	8·953	126·218	79·323
6	2 27 26·0	21	421·238	0·673	6·091	8·946	126·218	79·272
7	2 34 53·5	22	422·432	0·645	4·357	9·033	126·218	78·756
8	2 41 48·0	23	422·087	0·606	4·865	9·016	126·218	78·874
9	2 41 30·0	23	421·304	0·609	5·711	8·973	126·218	78·919
10	2 34 27·0	22	421·227	0·651	5·808	8·966	126·218	78·977
11	2 34 51·5	22	422·341	0·631	4·454	9·038	126·866	78·108
12	2 34 45·5	22	422·068	0·583	4·898	9·024	126·866	78·226
13	2 41 32·0	23	421·391	0·597	5·829	8·977	126·864	78·468
14	2 48 27·0	24	421·125	0·577	6·154	8·952	126·864	78·490
15	2 34 45·5	22	422·068	0·682	4·759	9·031	125·731	79·287
16	2 41 40·0	23	421·739	0·597	5·139	9·015	125·731	79·287
17	2 34 33·0	22	421·500	0·631	5·512	8·988	125·731	79·435
18	3 9 34·5	27	421·278	0·517	5·647	8·972	125·730	79·225
19	2 34 43·0	22	421·955	0·621	4·674	9·024	125·731	79·065
20	3 2 45·0	26	421·731	0·587	5·034	9·010	125·731	79·160
	53 31 55·5	457					Mean =	85878·957

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Appendix. *Table VI.—Fernando de Noronha.*

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
			Pendulum No. 10.					
	h m s		s	+	+	+	−	
1	2 20 53·0	21	402·524	0·594	7·665	9·572	101·204	85887·335 *
2	2 27 31·0	22	402·318	0·651	7·982	9·562	101·204	87·479
3	2 34 7·5	23	402·065	0·640	8·269	9·542	101·204	87·465
4	2 40 44·5	24	401·854	0·585	8·566	9·527	101·204	87·466
5	2 27 37·5	22	402·613	0·633	7·580	9·576	101·473	87·119
6	2 27 36·0	22	402·545	0·621	7·741	9·571	101·473	87·191
7	2 20 48·0	21	402·286	0·655	8·092	9·546	101·473	87·274
8	2 27 26·0	22	402·091	0·594	8·409	9·526	101·473	87·302
9	2 27 34·0	22	402·455	0·664	7·580	9·573	101·711	86·740
10	2 27 32·0	22	402·364	0·655	7·881	9·563	101·711	86·925
11	2 40 53·0	24	402·208	0·580	8·354	9·528	101·711	87·122
12	2 27 21·5	22	401·886	0·633	8·671	9·506	101·711	87·126
13	2 27 31·0	22	402·318	0·695	7·868	9·558	101·522	87·087
14	2 34 12·0	23	402·261	0·651	8·143	9·551	101·522	87·250
15	2 40 47·0	24	401·958	0·649	8·579	9·521	101·522	87·331
16	2 27 17·0	22	401·682	0·655	8·913	9·501	101·522	87·355
17	2 27 34·5	22	402·477	0·673	7·677	9·564	101·672	86·900
18	2 27 37·0	22	402·591	0·594	7·783	9·569	101·672	87·055
19	2 27 34·0	22	402·455	0·633	8·028	9·547	101·672	87·170
20	2 27 28·0	22	402·182	0·682	8·261	9·532	101·672	87·146
21	2 34 26·5	23	402·891	0·661	7·310	9·596	102·081	86·586
	52 24 31·0	469					Mean =	85887·163
					Add for hei	ght above	the Sea =	0·096
								85887·259
			Pendulum No. 11.					
1	2 30 9·5	17	529·971	0·601	8·375	9·535	102·203	85990·252
2	2 30 25·0	17	530·882	0·640	7·551	9·581	102·323	89·953

* In explanation of the cause of the present intervals between the coincidences of the two pendulums being some seconds less than formerly, it will be proper to state that, after the clock had been used in the Mountain experiments at Ascension, its pendulum was cleaned from the rust it had received whilst at Ascension.—F.

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Appendix. Table VI.—Fernando de Noronha.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	−	
3	2 30 20·0	17	535·588	0·609	7·889	9·569	102·323	85990·066
4	2 39 6·0	18	530·333	0·585	8·206	9·545	102·322	90·200
5	2 30 7·5	17	529·853	0·640	8·439	9·530	102·322	90·158
6	2 48 6·5	19	530·868	0·578	7·605	9·575	102·124	90·129
7	2 30 20·5	17	530·618	0·631	7·796	9·570	102·124	90·214
8	2 39 9·5	18	530·528	0·577	7·656	9·567	102·124	89·962
9	2 30 9·5	17	529·941	0·640	8·321	9·535	102·124	90·298
10	2 39 21·0	18	531·167	0·628	7·390	9·581	101·616	90·661
11	2 48 8·0	19	530·947	0·603	7·656	9·573	101·616	90·759
12	2 30 18·0	17	530·471	0·619	8·046	9·548	101·616	90·848
13	2 30 11·0	17	530·059	0·609	8·257	9·536	101·616	90·784
14	2 30 26·5	17	530·971	0·589	7·458	9·583	102·303	89·885
15	2 30 21·5	17	530·676	0·640	7·729	9·574	102·303	90·037
16	2 30 14·0	17	530·235	0·631	8·122	9·546	102·303	90·102
17	2 38 56·5	18	529·806	0·597	8·375	9·529	102·303	90·040
18	2 30 23·0	17	530·765	0·661	7·436	9·591	102·303	89·818
	46 16 13·5	314					Mean =	85990·231
					Add for height above the Sea=			0·096
								85990·327

Maranham.

Pendulum No. 10.

				+	+	+	−	
1	2 33 20·5	23	400·022	0·571	8·363	9·564	112·863	85873·658
2	2 33 18·0	23	399·913	0·609	8·451	9·566	112·863	73·669
3	2 33 13·5	23	399·717	0·601	8·558	9·558	112·863	73·548
4	2 33 14·0	23	399·739	0·609	8·663	9·544	112·863	73·670
5	2 33 19·0	23	399·957	0·601	8·481	9·558	113·042	73·551
6	2 33 17·0	23	399·870	0·601	8·603	9·555	113·042	73·581
7	2 33 15·0	23	399·783	0·609	8·692	9·544	113·042	73·568
8	2 39 54·5	24	399·771	0·560	8·769	9·529	113·042	73·568
9	2 26 38·5	22	399·932	0·537	8·469	9·544	112·952	73·524
10	2 33 13·5	23	399·717	0·621	8·607	9·544	112·952	73·514

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Appendix. Table VI.—Maranham.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	−	
11	2 33 9·5	23	399·543	0·621	8·756	9·530	112·952	85873·460
12	2 33 9·5	23	399·543	0·621	8·832	9·513	112·952	73·519
13	2 33 17·0	23	399·870	0·583	8·481	9·545	112·574	73·894
14	2 33 15·5	23	399·804	0·601	8·545	9·549	112·574	73·909
15	2 33 12·0	23	399·652	0·592	8·642	9·546	112·574	73·829
16	2 33 10·5	23	399·587	0·574	8·748	9·520	112·574	73·821
17	2 33 16·5	23	399·848	0·633	8·346	9·564	113·052	73·326
18	2 33 14·5	23	399·761	0·661	8·481	9·562	113·052	73·393
19	2 46 33·0	25	399·720	0·585	8·650	9·544	113·052	73·424
	48 45 1·5	439					Mean =	85873·601
					Add for height above the Sea =			0·211
								85873·812
				Pendulum No. 11.				
1	2 37 36·5	18	525·361	0·606	8·451	9·557	113·416	85976·281
2	2 37 38·0	18	525·444	0·594	8·545	9·558	113·416	76·416
3	2 55 5·0	20	525·250	0·557	8·705	9·544	113·416	76·404
4	2 11 13·5	15	524·900	0·670	8·820	9·531	113·416	76·399
5	2 46 24·0	19	525·474	0·582	8·502	9·545	113·386	76·397
6	2 37 37·0	18	525·389	0·597	8·659	9·544	113·386	76·515
7	2 46 18·5	19	525·184	0·582	8·756	9·531	113·386	76·455
8	2 28 47·0	17	525·118	0·621	8·862	9·515	113·386	76·543
9	2 20 7·0	16	525·438	0·655	8·672	9·548	112·988	77·018
10	2 46 24·0	19	525·474	0·545	8·727	9·551	112·988	77·009
11	2 37 37·0	18	525·389	0·585	8·789	9·536	112·988	77·023
12	2 20 3·0	16	525·189	0·655	8·938	9·514	112·988	77·094
13	2 37 41·0	18	525·611	0·609	8·705	9·550	112·988	77·115
14	2 37 40·0	18	525·556	0·548	8·785	9·552	112·988	77·102
15	2 46 22·0	19	525·368	0·603	8·874	9·539	112·988	77·115
16	2 37 37·5	18	525·418	0·577	8·959	9·525	112·988	77·192
	41 44 11·0	286					Mean =	85976·755
					Add for height above the Sea =			0·211
								85976·966

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APPENDIX. TABLE VI.—Maranham.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
			Copper Pendulum (Knife edge A).					
	h m s		s	+	+	+	−	
1	2 34 22·0	17	544·824	0·566	8·132	11·065	17·984	86084·612
2	2 43 33·0	18	545·167	0·668	8·160	11·073	17·984	84·949
3	2 43 23·0	18	544·611	0·660	8·193	11·062	17·984	84·640
4	2 25 2·0	16	543·875	0·829	8·254	11·043	17·984	84·422
5	2 34 9·5	17	544·088	0·893	8·010	11·059	18·253	84·113
6	2 34 25·5	17	545·029	0·775	8·030	11·064	18·253	84·568
7	2 34 14·0	17	544·353	0·873	8·071	11·052	18·253	84·302
8	2 43 14·5	18	544·139	0·872	8·201	11·033	18·253	84·287
9	2 34 50·0	17	546·471	0·888	8·023	11·058	19·020	84·738
10	3 2 25·0	20	547·250	0·758	8·071	11·058	19·020	85·106
11	2 34 40·0	17	545·882	0·877	8·160	11·043	19·020	84·608
12	2 34 20·0	17	544·706	0·784	8·376	11·019	19·020	83·924
	31 38 38·5	209			(First Series)		Mean =	86084·522
13	2 34 34·0	17	545·529	0·732	7·875	11·053	18·880	86084·023 *
14	2 34 39·5	17	545·853	0·784	7·929	11·058	18·880	84·322
15	2 34 24·5	17	544·971	0·990	8·010	11·047	18·880	84·086
16	2 34 21·0	17	544·765	0·848	8·132	11·031	18·880	83·930
	10 17 59·0	68			(Second Series)		Mean =	86084·090
	41 56 37·5	277	.....	....	....	General	Mean =	86084·414
					Add for height above the Sea=			0·211
								86084·625
			(Knife edge B).					
1	2 42 25·0	18	541·389	0·756	8·132	11·634	18·860	86082·483
2	2 33 32·5	17	541·912	0·848	8·214	11·636	18·860	82·967

* In consequence of the irregularities in the total intervals between the coincidences in the consecutive observations on them, on the days wherein the pendulum vibrated on the knife edge A, I have repeated the observation on that knife edge, in order to the elucidation of the cause of the irregularities observed.—F.

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Appendix. Table VI.—Maranham.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	+	+	−	
3	2 33 26·5	17	541·559	0·756	8·214	11·629	18·860	86082·660
4	2 33 22·5	17	541·324	0·799	8·344	11·612	18·860	82·678
5	2 33 24·5	17	541·441	0·808	8·214	11·638	18·701	82·811
6	2 33 31·0	17	541·824	0·874	8·241	11·643	18·701	83·134
7	3 9 40·5	21	541·929	0·795	8·282	11·636	18·701	83·151
8	2 33 30·5	17	541·794	0·794	8·344	11·623	18·701	83·120
9	2 33 38·5	17	542·206	0·673	7·969	11·640	18·880	82·704
10	2 33 38·5	17	542·265	0·785	8·010	11·647	18·880	82·899
11	3 0 46·0	20	542·300	0·758	8·051	11·636	18·880	82·922
12	2 42 29·0	18	541·611	0·843	8·111	11·619	18·880	82·645
	32 3 25·0	213					Mean =	86082·848
							Add for height above the Sea =	0·211
								86083·059

Para.

Pendulum No. 10.

				+	+	+	−	
1	2 32 24·5	23	397·587	0·603	9·251	9·498	109·477	85875·253
2	2 32 36·0	23	398·087	0·642	8·672	9·549	109·198	75·589
3	2 39 16·0	24	398·167	0·580	8·786	9·546	109·198	75·725
4	2 39 11·0	24	397·958	0·606	9·031	9·527	109·198	75·749
5	2 19 14·0	21	397·810	0·626	9·137	9·511	109·198	75·697
6	2 26 4·0	22	398·364	0·556	8·523	9·553	109·378	75·479
7	2 32 41·0	23	398·304	0·571	8·629	9·556	109·378	75·538
8	2 39 17·0	24	398·208	0·571	8·904	9·532	109·378	75·684
9	2 32 35·5	23	398·065	0·621	9·073	9·509	109·378	75·725
10	2 32 42·5	23	398·370	0·601	8·629	9·548	109·547	75·463
11	2 32 41·5	23	398·326	0·601	8·756	9·548	109·547	75·542
12	2 32 40·0	23	398·261	0·571	8·959	9·531	109·547	75·627
13	2 19 20·0	21	398·095	0·636	9·137	9·512	109·547	75·670
14	2 32 49·5	23	398·674	0·621	8·490	9·556	109·548	75·781
15	2 32 49·0	23	398·652	0·592	8·621	9·554	109·548	75·757
16	2 32 44·0	23	398·435	0·542	8·874	9·531	109·547	75·702

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APPENDIX. TABLE VI.—Para.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	−	
17	2 32 41·5	23	398·326	0·580	9·086	9·508	109·547	85875·811
18	2 26 14·0	22	398·818	0·544	8·642	9·546	109·548	75·903
	45 32 1·0	411					Mean =	85875·650
						Add for height above the Sea =		0·111
								85875·761
			Pendulum No. 11.					
1	2 36 32·0	18	521·778	0·685	8·579	9·552	108·951	85978·690
2	2 36 33·5	18	521·861	0·606	8·684	9·552	108·951	78·779
3	2 36 32·0	18	521·778	0·606	8·820	9·530	108·951	78·830
4	2 36 38·0	18	522·111	0·577	8·853	9·513	108·951	79·028
5	2 37 8·0	18	523·778	0·612	8·426	9·555	109·330	79·352 *
6	2 45 30·5	19	522·658	0·573	8·523	9·549	109·330	78·697
7	2 36 39·0	18	522·167	0·624	8·870	9·524	109·330	78·760
8	2 27 53·5	17	521·971	0·640	9·040	9·503	109·330	78·801
9	2 36 48·5	18	522·694	0·606	8·494	9·550	109·150	78·905
10	2 36 45·5	18	522·528	0·637	8·650	9·542	109·150	78·979
11	2 36 42·5	18	522·360	0·624	8·913	9·515	109·150	79·096
12	2 27 56·5	17	522·147	0·661	9·073	9·490	109·150	79·133
13	2 36 48·0	18	522·667	0·615	8·714	9·531	109·110	79·138
14	2 36 45·0	18	522·500	0·615	8·862	9·529	109·110	79·178
15	2 36 41·5	18	522·306	0·637	9·086	9·507	109·110	79·279
16	2 27 51·5	17	521·853	0·601	9·212	9·487	109·110	79·063
17	2 45 26·5	19	522·447	0·632	8·714	9·532	109·260	78·867
18	2 36 43·5	18	522·417	0·606	8·862	9·531	109·260	78·969
19	2 36 37·5	18	522·083	0·628	9·086	9·507	109·260	78·979
20	2 27 51·0	17	521·824	0·640	9·276	9·482	109·260	78·992
21	2 36 45·0	18	522·500	0·628	8·714	9·532	109·260	78·896 *
22	2 36 48·0	18	522·667	0·606	8·870	9·532	109·260	79·136
	57 9 57·0	394					Mean =	85978·979
						Add for height above the Sea =		0·111
								85979·090

* Several carts passed the street door during the continuance of these experiments.—F.

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Appendix. Table VI.—Para.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
			Iron Pendulum (Knife edge A).					
	h m s		s	+	+	+	−	
1	2 24 23·0	16	541·438	0·664	5·976	12·753	20·853	86079·390
2	2 42 44·0	18	542·444	0·788	6·013	12·760	20·853	80·150
3	2 33 37·5	17	542·206	0·769	6·148	12·732	20·853	80·098
4	2 33 23·5	17	541·382	0·803	6·273	12·700	20·853	79·740
5	2 33 13·5	17	540·794	0·838	6·028	12·746	21·002	79·080
6	2 33 27·0	17	541·588	0·769	6·062	12·753	21·002	79·520
7	2 42 24·0	18	541·333	0·802	6·201	12·730	21·002	79·519
8	2 24 16·0	16	541·000	0·770	6·322	12·704	21·002	79·386
9	2 33 37·0	17	542·176	0·794	5·947	12·757	20·414	80·386
10	2 33 53·0	17	543·118	0·750	5·976	12·773	20·414	80·922
11	2 33 45·0	17	542·647	0·848	6·129	12·731	20·414	80·855
12	2 33 35·0	17	542·089	0·736	6·264	12·701	20·414	80·520
	30 42 18·5	204					Mean =	86079·964
					Add for height above the Sea =			0·111
								86080·075
			(Knife edge B).					
1	2 34 33·5	17	545·500	0·823	6·019	13·525	19·827	86083·766 *
2	2 34 48·0	17	546·353	0·755	6·057	13·529	19·827	84·234
3	2 34 50·0	17	546·471	0·736	6·206	13·496	19·827	84·400
4	2 25 49·0	16	546·813	0·765	6·350	13·465	19·827	84·740
5	2 43 53·0	18	546·278	0·693	5·962	13·513	19·827	84·018
6	2 53 22·0	19	547·474	0·789	5·976	13·521	19·827	84·828
7	2 34 54·0	17	546·706	0·736	6·106	13·486	19·827	84·426
8	2 25 41·5	16	546·344	0·784	6·215	13·461	19·827	84·348
9	2 34 45·0	17	546·176	0·842	5·869	13·540	19·827	84·042
10	2 43 58·0	18	546·556	0·749	5·898	13·550	19·827	84·208
11	2 43 53·5	18	546·306	0·783	5·999	13·523	19·827	84·171
12	2 7 16·0	14	545·429	0·842	6·106	13·491	19·827	83·797
13	2 16 29·0	15	545·933	0·678	5·789	13·553	19·827	83·670
	33 14 12·5	219					Mean =	86084·204
					Add for height above the Sea =			0·111
								86084·315

* During this experiment the telescope was not exactly adjusted.—F.

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APPENDIX. TABLE VI.—Para.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
			Copper Pendulum (Knife edge A).					
	h m s		s	+	+	+	−	
1	2 45 6·0	18	550·333	0·718	8·376	11·051	20·615	86085·538
2	2 36 12·0	17	551·294	0·809	8·437	11·053	20·615	86·229
3	2 36 15·0	17	551·471	0·779	8·567	11·028	20·615	86·415
4	2 36 10·0	17	551·176	0·794	8·648	11·006	20·615	86·321
5	2 36 5·0	17	550·882	0·756	8·214	11·053	20·904	85·440 *
6	2 45 40·5	18	552·250	0·703	8·336	11·050	20·904	86·284
7	2 36 13·0	17	551·353	0·779	8·600	11·022	20·904	86·086
8	2 26 49·5	16	550·594	0·809	8·751	11·001	20·904	85·814
9	2 36 4·0	17	550·824	0·799	8·336	11·046	20·685	85·784
10	2 45 34·5	18	551·917	0·764	8·437	11·040	20·685	86·466
11	2 36 10·5	17	551·206	0·823	8·608	11·013	20·685	86·264
12	2 35 57·5	17	550·441	0·813	8·783	10·983	20·685	85·963
13	2 36 11·0	17	551·235	0·823	8·499	11·027	20·824	86·047
14	2 36 20·5	17	551·794	0·823	8·567	11·030	20·824	86·436
	36 46 49·0	240					Mean =	86086·077
						Add for height above the Sea =		0·111
								86086·188
			(Knife edge B).					
1	2 53 19·0	19	547·316	0·769	8·832	11·578	20·824	86084·632 †
2	2 25 42·0	16	546·375	0·808	8·966	11·553	20·824	84·236
3	2 44 22·0	18	547·889	0·737	8·518	11·606	20·794	84·675
4	2 35 22·5	17	548·382	0·868	8·588	11·609	20·794	85·162
5	2 35 11·0	17	547·706	0·900	8·803	11·579	20·794	84·990
6	2 26 0·0	16	547·500	0·700	8·995	11·549	20·794	84·834
7	2 35 25·0	17	548·529	0·829	8·567	11·603	21·123	84·852

* Several carts passed the street door during the continuance of this experiment.—F.

† On inverting the pendulum, for this experiment, the adjustments were examined, and found to be correct.—F.

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Appendix. Table VI.—Para.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	−	
8	2 35 38·0	17	549·294	0·874	8·669	11·606	21·123	86085·440*
9	2 35 25·0	17	548·529	0·936	8·844	11·586	21·123	85·219
10	2 26 3·0	16	547·687	0·852	8·954	11·569	21·123	84·743
11	2 35 16·5	17	548·029	0·808	8·526	11·619	20·704	84·938
12	2 35 28·0	17	548·706	0·804	8·567	11·624	20·704	85·368
13	2 35 16·0	17	548·000	0·853	8·783	11·602	20·704	85·206
14	2 25 54·5	16	547·156	0·884	8·925	11·580	20·704	84·870
	36 4 22·5	237			(Omitting	Exp. 8.)	Mean =	86084·902
					Add for hei	ght above	the Sea=	0·111
								86085·013

Trinidad.

Pendulum No. 10.

				+	+	+	−	
1	2 33 39·0	23	400·826	0·612	8·684	9·566	105·670	85882·082
2	2 40 18·5	24	400·771	0·628	9·031	9·555	105·670	82·374
3	2 26 54·0	22	400·636	0·645	9·319	9·529	105·670	82·508
4	2 26 54·0	22	400·636	0·612	9·348	9·519	105·670	82·494
5	2 27 1·5	22	400·977	0·594	8·672	9·555	105·899	81·974
6	2 27 0·0	22	400·909	0·594	8·981	9·544	105·899	82·199
7	2 33 34·0	23	400·609	0·571	9·526	9·507	105·899	82·360
8	2 33 31·5	23	400·500	0·609	9·569	9·498	105·899	82·316
9	2 33 42·5	23	400·978	0·661	8·925	9·536	105·889	82·286
10	2 26 59·5	22	400·886	0·651	9·276	9·524	105·889	82·516
11	2 26 57·0	22	400·773	0·535	9·530	9·500	105·889	82·509
12	2 33 37·0	23	400·739	0·621	9·518	9·489	105·889	82·535
13	2 20 22·5	21	401·071	0·636	8·769	9·538	105·491	82·605
14	2 40 25·0	24	401·042	0·606	9·061	9·533	105·491	82·831
15	2 40 19·0	24	400·792	0·597	9·467	9·504	105·491	82·930

* This experiment is probably erroneous, as I felt a little confused during the latter part, owing to the noise of some blacks who were squabbling in the street, opposite the pendulum room: and therefore it will be well to reject it altogether.—F. On this account, and as it is not in accordance with the rest, I have rejected it in taking the mean.—B.

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APPENDIX. TABLE VI.—Trinidad.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	−	
16	2 26 58·5	22	400·841	0·553	9·484	9·496	105·491	85882·948
17	2 26 54·0	22	400·636	0·695	8·777	9·534	105·521	82·170
18	2 26 54·0	22	400·636	0·621	9·094	9·526	105·521	82·405
19	2 33 34·0	23	400·609	0·571	9·421	9·508	105·521	82·635
20	2 27 2·0	22	401·000	0·673	9·251	9·509	105·521	82·989
	50 12 37·5	451					Mean =	85882·483
				Add for height above the Sea =				0·058
								85882·541
			Pendulum No. 11.					
1	2 20 31·0	16	526·938	0·655	8·955	9·535	105·479	85985·733
2	2 47 13·0	19	528·053	0·553	9·400	9·503	105·479	86·737
3	2 12 12·0	15	528·800	0·636	9·475	9·494	105·479	87·348
4	2 38 23·5	18	527·972	0·619	8·756	9·533	105·409	86·209
5	2 29 30·5	17	527·676	0·601	9·031	9·528	105·409	86·277
6	2 38 12·0	18	527·333	0·585	9·442	9·496	105·409	86·427
7	2 38 27·0	18	528·167	0·609	8·642	9·542	105·260	86·363
8	2 29 37·0	17	528·059	0·609	8·777	9·545	105·260	86·435
9	2 47 6·0	19	527·684	0·525	9·086	9·517	105·260	86·399
10	2 20 44·0	16	527·750	0·664	9·128	9·505	105·260	86·609
11	2 29 48·0	17	528·706	0·621	8·523	9·543	105·140	86·711
12	2 38 36·0	18	528·667	0·585	8·913	9·533	105·140	87·031
13	2 38 23·0	18	527·944	0·615	9·107	9·510	105·140	86·784
14	2 20 50·5	16	528·156	0·676	9·094	9·503	105·140	86·957
15	2 38 39·0	18	528·833	0·628	8·545	9·540	105·500	86·456
16	2 29 54·0	17	529·059	0·580	8·785	9·536	105·500	86·783
17	2 29 50·0	17	528·824	0·533	8·981	9·518	105·500	86·769
	43 7 56·5	294					Mean =	85986·590
				Add for height above the Sea =				0·058
								85986·648
			Iron Pendulum (Knife edge A).					
				+	+	+	+	
1	2 41 57·0	19	511·421	0·658	6·230	12·717	4·353	86086·076
2	2 24 58·5	17	511·676	0·784	6·403	12·710	4·353	86·536

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Appendix. Table VI.—Trinidad.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		p	+	+	+	+	
3	2 24 51·0	17	511·471	0·904	6·604	12·676	4·353	86086·688
4	2 33 32·5	18	511·806	0·813	6·201	12·724	4·204	86·314
5	2 25 9·0	17	512·294	0·813	6·201	12·736	4·204	86·647
6	2 59 13·0	21	512·048	0·802	6·388	12·701	4·204	86·626
7	2 7 58·0	15	511·867	0·956	6·474	12·680	4·204	86·726
8	2 33 39·0	18	512·167	0·783	6·033	12·733	4·014	86·173
9	2 42 19·5	19	512·605	0·850	6·192	12·731	4·014	86·685
	22 53 37·5	161					Mean =	86086·497
					Add for height above the Sea =			0·058
								86086·555
			(Knife edge B).					
1	2 51 8·0	20	513·400	0·725	6·422	13·466	4·014	86088·047
2	2 34 6·0	18	513·667	0·663	6·480	13·450	4·014	88·002
3	2 34 15·5	18	514·194	0·883	6·042	13·509	3·556	87·930
4	2 34 24·0	18	514·667	1·067	6·186	13·505	3·556	88·563
5	2 34 29·5	18	514·972	0·919	6·330	13·478	3·556	88·731
6	2 25 51·0	17	514·765	0·935	5·904	13·519	3·556	88·226
7	2 34 37·5	18	515·417	0·858	5·889	13·533	3·556	88·573
8	2 43 8·0	19	515·158	0·882	5·942	13·510	3·556	88·459
9	2 26 0·5	17	515·324	0·833	5·990	13·486	3·556	88·542
	23 18 0·0	163					Mean =	86088·341
					Add for height above the Sea =			0·058
								86088·399
			Copper Pendulum (Knife edge A).					
1	2 43 36·5	19	516·658	0·698	8·608	11·060	6·156	86092·064
2	2 35 11·5	18	517·306	0·750	8·865	11·038	6·156	92·770
3	2 35 3·0	18	516·833	0·868	9·158	11·021	6·156	92·859
4	2 26 26·0	17	516·824	0·823	9·300	11·003	6·156	92·932
5	2 35 11·5	18	517·306	0·746	8·661	11·045	5·459	91·872
6	2 35 16·5	18	517·583	0·750	8·913	11·034	5·459	92·296

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APPENDIX. TABLE VI.—Trinidad.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+	+	
7	2 35 6·5	18	517·028	0·779	9·353	10·996	5·459	86092·369
8	2 26 30·0	17	517·059	0·889	9·524	10·978	5·459	92·652
9	2 35 23·0	18	517·944	0·813	8·926	11·019	5·230	92·361
10	2 44 5·0	19	518·158	0·758	9·177	11·011	5·230	92·687
11	2 35 21·0	18	517·833	0·750	9·442	10·980	5·230	92·703
12	2 35 22·0	18	517·889	0·794	9·483	10·965	5·230	92·809
	31 2 32·5	216					Mean =	86092·531
					Add for height above the Sea =			0·058
								86092·589
			(Knife edge B).					
1	2 25 55·0	17	515·000	0·728	8·824	11·598	5·409	86091·025
2	2 34 25·0	18	514·722	0·974	9·055	11·595	5·409	91·317
3	2 42 58·0	19	514·632	0·789	9·402	11·563	5·409	91·389
4	2 25 51·5	17	514·794	0·819	9·483	11·548	5·409	91·591
5	2 34 30·0	18	515·000	0·899	8·865	11·591	5·140	90·961
6	2 25 55·0	17	515·000	0·956	9·076	11·590	5·140	91·228
7	2 34 30·0	18	515·000	0·859	9·332	11·569	5·140	91·366
8	2 34 29·0	18	514·944	0·915	9·313	11·562	5·140	91·359
9	2 34 35·0	18	515·278	0·878	8·689	11·606	4·742	90·562
10	2 8 49·0	15	515·267	0·988	8·906	11·601	4·742	90·877
11	2 43 9·5	19	515·237	0·696	9·340	11·561	4·742	90·959
12	2 8 46·5	15	515·100	0·816	9·442	11·546	4·742	91·077
	29 53 53·5	209					Mean =	86091·143
					Add for height above the Sea =			0 058
								86091·201

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Appendix. Table VI.—Porto Bello.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
			Pendulum No. 10.					
	h m s		s	+	+	+	−	
1	2 14 40·0	20	404·000	0·626	6·502	9·648	101·684	85887·369
2	2 1 9·0	18	403·833	0·650	6·544	9·648	101·684	87·258
3	2 14 37·0	20	403·850	0·626	6·580	9·634	101·684	87·274
4	2 14 37·5	20	403·875	0·567	6·629	9·620	101·684	87·276
5	2 7 58·0	19	404·105	0·570	6·248	9·645	101·704	87·147
6	2 14 42·0	20	404·100	0·587	6·366	9·646	101·704	87·278
7	2 21 24·5	21	404·024	0·615	6·464	9·632	101·704	87·309
8	2 14 39·0	20	403·950	0·648	6·493	9·622	101·704	87·283
9	2 8 0·0	19	404·211	0·589	6·121	9·659	101·634	87·235
10	2 8 0·5	19	404·237	0·559	6·248	9·659	101·634	87·359
11	2 21 25·5	21	404·071	0·594	6·451	9·636	101·634	87·399
12	2 14 42·0	20	404·100	0·567	6·527	9·625	101·634	87·468
13	2 14 42·5	20	404·125	0·626	6·210	9·675	101·614	87·306
14	2 8 0·5	19	404·237	0·629	6·366	9·672	101·614	87·580
15	2 21 26·0	21	404·095	0·636	6·485	9·659	101·614	87·543
16	2 14 39·0	20	403·950	0·636	6·527	9·650	101·614	87·423
17	2 14 37·5	20	403·875	0·636	6·481	9·655	101·545	87·371
18	2 41 34·0	24	403·917	0·606	6·523	9·656	101·545	87·429
19	2 14 38·0	20	403·900	0·587	6·612	9·642	101·545	87·467
20	2 7 50·0	19	403·684	0·670	6·696	9·625	101·545	87·388
21	2 14 37·0	20	403·850	0·578	6·620	9·615	101·485	87·446
	47 8 59·5	420					Mean =	85887·362
					Add for height above the Sea =			0·033
								85887·395
			Pendulum No. 11.					
1	2 13 8·5	15	532·567	0·608	6·979	9·600	101·607	85991·113
2	2 22 19·5	16	533·719	0·603	6·979	9·592	101·607	91·801
3	2 13 38·0	15	534·533	0·667	6·988	9·584	101·607	92·359
4	2 13 14·5	15	532·967	0·626	6·844	9·610	101·817	91·040

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APPENDIX. TABLE VI.—Porto Bello.

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	+	+	−	
5	2 13 18·5	15	533·233	0·645	6·971	9·607	101·817	85991·345
6	2 57 56·0	20	533·800	0·517	7·097	9·587	101·817	91·667
7	2 4 31·0	14	533·643	0·648	7·170	9·573	101·817	91·762
8	2 57 56·0	20	533·800	0·517	6·916	9·614	101·628	91·702
9	2 13 26·0	15	533·733	0·615	7·073	9·611	101·628	91·914
10	2 22 22·0	16	533·875	0·624	7·191	9·595	101·628	92·111
11	2 22 22·0	16	533·875	0·612	7·267	9·581	101·628	92·161
12	2 22 25·5	16	534·094	0·612	6·937	9·616	101·747	91·880
13	2 13 32·0	15	534·133	0·615	7·093	9·615	101·747	92·061
14	2 40 24·5	18	534·694	0·537	7·225	9·597	101·747	92·436
15	2 13 29·5	15	533·967	0·667	7·233	9·587	101·747	92·125
	35 44 3·5	241					Mean=	85991·832
					Add for height above the Sea=			0·033
								85991·865

London (after the voyage).

Pendulum No. 10.

				+	+	+	+	
1	5 5 33·0	42	436·500	0·446	1·150	9·911	0·850	86016·480
2	4 50 6·5	40	435·162	0·448	2·158	9·870	0·900	16·283
3	5 4 29·0	42	434·976	0·416	2·255	9·878	0·950	16·236
4	7 8 51·0	59	436·119	0·311	1·616	9·919	0·950	16·574
	22 8 59·5	183					Mean =	86016·393
5	4 54 44·0	41	431·317	0·476	5·057	9·736	1·050	86015·686
6	3 36 7·5	30	432·250	0·542	4·264	9·771	0·960	15·768 *
7	3 21 23·5	28	431·553	0·627	4·885	9·747	1·000	15·844
	11 52 15·0	99					Mean =	86015·766

* Prior to this experiment, the pendulum had been dismounted, and a series of observations made with the Pendulum No. 11 on these planes.

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Appendix. *Table VI.—London (after the voyage).*

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	−	+	−	
8	2 7 37·5	17	450·441	0·813	10·418	10·586	1·190	86016·167
9	2 0 5·0	16	450·312	0·866	10·334	10·572	1·190	16·180
10	2 37 44·0	21	450·666	0·663	10·258	10·561	1·190	16·344
11	2 22 37·5	19	450·395	0·700	10·249	10·511	1·190	16·039
	9 8 4·0	73					Mean =	86016·182
	43 9 18·5	355	.....	....	....	General	Mean =	86016·146
				Add for height above the Sea =				0·278
								86016·424
				Pendulum No. 11.				
				+	+	+	+	
1	3 44 36·5	23	585·935	0·571	1·891	9·906	0·950	86118·403
2	5 40 29·5	35	583·700	0·413	2·927	9·856	0·900	18·054
3	5 49 36·0	36	582·666	0·364	3·363	9·845	0·850	17·854
4	6 39 3·5	41	583·988	0·342	2·884	9·877	0·900	18·107
	21 53 45·5	135					Mean =	86118·104
5	5 48 39·5	36	581·097	0·405	4·957	9·755	1·200	86118·946
6	5 47 57·0	36	579·916	0·381	5·203	9·742	1·250	18·597
7	6 45 38·5	42	579·488	0·296	4·407	9·778	1·270	17·558 †
	18 22 15·0	114					Mean =	86118·367
	40 16 0·5	249				General	Mean =	86118·217
					Add for height above the Sea =			0·278
								86118·495

* These four experiments were made by alternately reversing the face of the pendulum between each experiment; in order to ascertain whether such difference of position made any difference in the result.

† This experiment was made during the night; and the temperature ascertained by a self-registering thermometer, for its lowest point.

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APPENDIX. TABLE VI.—London (after the voyage).

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	Subsequent experiments, not included in the above Mean.						See page 38.	
	h m s		s	+	−	+	−	
8	2 24 32·5	14	619·464	0·477	8·917	10·525	0·180	86122·954
9	2 13 39·0	13	616·846	0·726	8·219	10·460	0·180	22·652 *
10	2 55 7·0	17	618·059	0·490	8·143	10·379	0·080	23·062 †
11	4 59 56·5	29	620·569	0·271	8·502	10·153	0·000	23·468 †
12	1 12 7·0	7	618·142	0·622	8·283	10·222	0·030	22·983 ‡
	13 45 22·0	80					Mean =	86123·024
					Add for height above the Sea =			0·278
								86123·302
			Iron Pendulum (Knife edge A).					
				+	+	+	+	
1	2 24 55·5	10	869·550	0·602	3·148	13·027	1·300	86219·353
2	3 51 46·5	12	869·156	0·394	3·386	12·974	1·320	19·260 §
	6 16 42·0	22					Mean =	86219·306
3	3 9 51·2	13	876·250	0·447	2·448	13·083	0·080	86218·854 ‖
4	18 13 6·5	70	936·950	0·316	2·376	0·452	0·080	18·797
5	23 25 24·0	90	936·933	0·253	2·260	0·561	0·100	18·744
6	4 38 10·5	19	878·447	0·267	2·074	13·151	0·090	18·871
	49 26 32·2	192					Mean =	86218·816

* Prior to this experiment, the pendulum had been reversed in the Y's; and a set of coincidences taken in that position, in order, if possible, to discover the remarkable discordance between the the preceding results and those made in July 1831.

† Prior to each of these experiments also, the pendulum had been reversed in the Y's; and several sets of coincidences, taken each time in that position of the pendulum: but the results did not differ much from those here recorded.

‡ Prior to this experiment I had taken several sets of coincidences with the knife edge, purposely inclined on the agate planes; but could not make the results materially different. I then dismounted the pendulum, wiped it clean, examined every part of it, in order to see if any thing stuck to it: but found every thing correct. The experiment was then made; and the result is the same as before.

§ Previous to this experiment, the pendulum had been reversed, and two series of observations taken with the end B uppermost.

‖ This experiment, and the three following ones, were made with that side of the pendulum towards the observer, which is marked with the capital letter A.

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Appendix. *Table VI.—London (after the voyage).*

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
	h m s		s	+	−	+	+	
7	20 26 7·0	77	955·416	0·212	1·325	0·626	0·480	86219·129 *
8	13 46 27·5	52	953·606	0·384	1·109	0·553	0·480	19·101
9	3 28 1·5	14	891·536	0·443	1·570	13·490	0·400	18·941
10	3 57 56·5	16	892·281	0·415	1·512	13·478	0·400	19·120
	41 38 32·5	159					Mean =	86219·073
	97 21 46·7	373	.....	....	....	General	Mean =	86219·017
				Add for height above the Sea =				0·278
								86219·295
			(Knife edge *b*).					
				+	+	+	+	
1	2 55 59·5	12	879·958	0·752	3·544	13·782	1·300	86223·005
2	4 39 42·5	19	883·290	0·355	2·923	13·824	1·320	22·789
	7 35 42·0	31					Mean =	86222·897
3	3 42 57·5	15	891·833	0·434	2·707	13·876	0·070	86223·330
4	17 52 51·5	67	960·769	0·346	2·491	0·494	0·090	23·565
5	18 40 22·5	70	960·321	0·262	2·404	0·592	0·160	23·478
6	5 13 43·5	21	896·357	0·300	2·218	13·886	0·150	23·773
	45 29 55·0	173					Mean =	86223·536
				+	−	+	+	
7	13 17 39·5	49	976·724	0·264	1·570	0·618	0·400	86222·814
8	15 9 23·5	56	974·348	0·386	1·555	0·762	0·360	22·603
9	4 17 0·0	17	907·060	0·381	1·555	14·054	0·340	22·715
10	2 0 42·5	8	905·312	0·532	1·417	14·085	0·340	22·707
11	2 45 49·5	11	904·500	0·565	1·325	14·054	0·340	22·589
	37 30 35·0	141					Mean =	86222·686
	90 36 12·0	345	.....	....	....	General	Mean =	86223·033
				Add for height above the Sea =				0·278
								86223·311
			Deduct (See page 68)	for difference of			B and *b* =	2·038
								86221·273

* This experiment, and the three following ones, were made with the reverse side of the pendulum (marked *a*) towards the observer.

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APPENDIX. TABLE VI.—London (after the voyage).

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for Arc.	Thermom.	Barometer.	Rate.	Vibrations in a Mean Solar Day.
			Copper Pendulum (Knife edge A).					
	h m s		s	+	+	+	+	
1	5 57 15·0	24	893·125	0·275	4·640	11·223	1·320	86223·980
2	4 29 36·5	18	898·694	0·361	3·398	11·258	1·000	23·737 *
	10 27 51·5	42					Mean =	86223·859
3	7 3 54·2	28	908·367	0·210	2·890	11·376	0·180	86224·425
4	6 49 53·0	27	910·852	0·230	2·605	11·404	0·100	24·626
5	16 3 17·5	60	963·292	0·408	3·072	0·381	0·060	24·562
6	15 34 15·0	58	966·465	0·306	2·625	0·446	−0·060	24·537
7	5 19 23·5	21	912·548	0·279	2·218	11·400	0·060	24·477
8	5 3 19·0	20	909·950	0·274	2·645	11·334	0·070	24·283
	55 54 2·2	214					Mean =	86224·485
				+	−	+	+	
9	3 21 38·0	13	930·616	0·523	2·605	11·727	0·300	86224·261
10	16 51 57·0	61	995·361	0·313	3·440	0·476	0·330	24·073
11	14 41 54·0	53	998·377	0·348	3·928	0·622	0·290	24·250
12	3 38 44·5	14	937·464	0·490	4·091	11·848	0·300	24·219
13	3 22 50·5	13	936·192	0·506	3·867	11·831	0·300	24·193
14	7 17 12·5	28	936·875	0·241	3·684	11·810	0·300	24·224
	49 14 16·5	182					Mean =	86224·203
	115 36 10·2	438	.....	....	....	General	Mean =	86224·275
					Add for height above the Sea =			0·278
								86224·553
			(Knife edge B).					
				+	+	+	+	
1	3 57 18·5	16	889·906	0·496	3·744	11·880	1·300	86223·243
2	4 11 50·5	17	888·853	0·443	4·029	11·860	1·300	23·225
	8 9 9·0	33					Mean =	86223·234

* Previous to this experiment, the pendulum had been reversed, and two series of observations taken with the end B uppermost.

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Appendix. *Table VI.—London (after the voyage).*

No.	Total Interval.	No. of Coincid.	Mean Interval.	Corrections for				Vibrations in a Mean Solar Day.
				Arc.	Thermom.	Barometer.	Rate.	
	h m s		s	+	+	+		
3	6 1 44·7	24	904·365	0·315	1·567	11·987	0·000	86222·795
4	4 46 12·0	19	903·789	0·400	1·709	11·980	0·000	22·893
5	17 56 7·5	67	963·694	0·394	1·424	0·415	0·000	22·923
6	18 28 34·5	69	963·971	0·352	1·099	0·503	−0·050	22·670
7	4 2 3·0	16	907·687	0·429	0·752	11·946	0·110	22·608
8	5 17 25·0	21	906·905	0·330	0·997	11·986	0·110	22·664
	56 32 6·7	216					Mean =	86222·759
				+	−	+	+	
9	4 53 17·0	19	926·158	0·366	3·562	12·348	0·260	86222·835
10	4 6 45·5	16	925·969	0·378	3·400	12·320	0·260	22·943
11	12 2 1·5	44	984·579	0·562	2·971	0·434	0·280	22·798
12	11 28 59·5	42	984·274	0·527	3·154	0·536	0·300	22·648
13	4 23 13·0	17	929·000	0·420	4·213	12·184	0·370	22·755
14	2 19 12·5	9	928·056	0·682	4·274	12·178	0·370	22·760
15	3 6 7·5	12	930·625	0·571	4·864	12·263	0·370	22·658
	42 19 36·5	159					Mean =	86222·771
	107 0 52·2	408	.....	....	....	General Mean =		86222·828
						Add for height above the Sea =		0·278
								86223·106

London: Printed by William Clowes, 14, Charing Cross.

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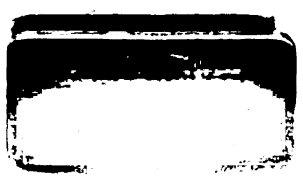

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